Facultad de Ciencias y Tecnologías Químicas

Universidad de Castilla- La Mancha

# XI YOUNG SCIENCE SYMPOSIUM

Del 7 al 9 de Junio de 2017

## LIBRO DE COMUNICACIONES

# *Bienvenida del Decano*

Os damos la bienvenida a esta nueva edición del 11th Young Science Symposium, que organiza la Facultad de Ciencias y Tecnologías Químicas de la Universidad de Castilla – La Mancha junto con sus jóvenes investigadores.

Es el XI Simposio, que nació con este formato en la edición del año 2013. Previamente, y desde el año 2007, se había desarrollado como jornadas de sesiones cortas a lo largo de los meses de abril a junio. En todos los casos, ha sido siempre un compromiso de la Facultad por la investigación y hacia sus jóvenes investigadores. Promover y divulgar la investigación en los campos científicos y tecnológicos que tiene que ver con la Química, la Ingeniería Química, y la Ciencia y Tecnología de los Alimentos, que son las enseñanzas tradicionales de nuestro Centro.

El objetivo es doble: divulgar y dar a conocer lo que nuestros jóvenes investigadores hacen, e introducirlos en la organización de pequeños eventos científicos, que a escala reducida sirvan de ejemplo de cómo se organizan los congresos a los que después ellos asisten, a nivel nacional e internacional, presentando los resultados de sus trabajos científicos. Constituye también una actividad formativa para los estudiantes de nuestros programas de doctorado, después de los cambios que éstos han experimentado a partir del año 2011. Hay que subrayar que en esta edición se ha contado con la participación de jóvenes investigadores de otros campus (Toledo y Albacete) de la Universidad de Castilla-La Mancha cuyos temas de investigación están estrechamente relacionados con los campos científicos y tecnológicos que se desarrollan en este Centro, hecho que fomenta la interdisciplinaridad y el debate entre nuestros jóvenes investigadores y que tienen como nexo de unión los pilares fundamentales de esta Facultad. Es buena prueba de la magnífica aceptación del Simposio, que va creciendo de forma muy clara durante los últimos años. Además, continuaremos con la convocatoria del "II Premio Ciencia Joven" de la Facultad, novedad introducida la pasada edición, a fin de que sea un estímulo adicional para nuestros jóvenes investigadores que participan en el evento.

Desde la Facultad, que aporta la infraestructura y los recursos necesarios, hemos de felicitar al grupo de jóvenes que han estado detrás de la organización de esta edición, por su dedicación y entusiasmo. Agradecer a todos los participantes su respuesta y favorable acogida. A los investigadores invitados. A los patrocinadores; cada vez en mayor número. Al Rector, y al Vicerrector de Investigación y Política Científica de la UCLM, por su sensibilidad y apoyo a estos Simposia. Y, así, con estos respaldos, el convencimiento del éxito de esta undécima edición del Simposio Ciencia Joven.

**Ángel Ríos Castro**

*Decano de la Facultad*

# Comité Organizador:

**Ángel Ríos Castro**, *Decano de la Facultad*

**Alberto Ramos Alonso** *"Inorganic Chemistry"*

**Ana Raquel de la Osa Puebla** *"Chemical Engineering"*

**Maria Luz Sánchez Silva** *"Chemical Engineering"*

**Gema M. Durán Lizcano** *"Analytical Chemistry"*

**José Pérez Navarro** *"Food Sciences and Technology"*

**Iván Torres Moya** *"Organic Chemistry"*

**Virginia López Gómez** *"Biochemistry"*

**Sara López Sanz**, *"Analytical Chemistry"*

**Julián Rodríguez López** *"Sección Territorial de Castilla - La Mancha de la Real Sociedad Española de Química (RSEQ)"*

**Javier Torres**, *Photographer*

Estamos encantados de retomar durante los días 7, 8 y 9 de Junio la iniciativa del **"Young Science Symposium"**, siendo este año su **Undécima edición**.

Con este fin, un grupo de **jóvenes doctorandos** pertenecientes a la **Facultad de Ciencias y Tecnologías Químicas de Ciudad Real**, **Facultad de Ambientales de Toledo** y **Facultad de Medicina de Albacete** presentarán una serie de comunicaciones sobre el trabajo que están desarrollando en sus respectivas áreas. También contaremos con algunos investigadores invitados externos que nos darán una visión más general sobre la investigación en España, tanto en instituciones públicas como en la empresa privada.

Con el fin de incentivar y despertar el espíritu investigador entre los alumnos de la facultad, nuestra futura "cantera", la asistencia a las jornadas podrá ser convalidada por **un Crédito de Libre Configuración**. Creemos que esta iniciativa puede ser muy interesante para acercar a los alumnos a la verdadera actividad de los laboratorios de investigación de la facultad.

Por otro lado, a modo de incentivar a aquellos jóvenes doctorandos y nuevos doctores que participan como ponentes en estas jornadas, en esta convocatoria 2017, se concederá el **"II PRIZE OF YOUNG SCIENCE FACULTY OF SCIENCES AND TECHNOLOGY"**.

Por todo ello, os agradecemos vuestra participación y esperamos que la experiencia os sea de provecho.

No olvidéis visitar nuestra página web donde podréis encontrar las últimas novedades de estas jornadas, instantáneas de las presentaciones así como el Libro de Abstracts en formato electrónico:

http://www.uclm.es/CR/FQuimicas/

# PROGRAMA

# Programme:

## Wednesday, 7th June 2017

13:00-14:00 - Delivery of documentation.

14:00-16:00 - Lunch break.

16:00 - Welcome reception.

16:15 - ***Invited Lecturer:*** **Prof. Enrique Martínez de la Ossa Fernández** (Director of the Chemical Engineering and Food Technology Department, University of Cádiz). ***"Los fluidos supercríticos en Ingeniería Química".***

17:15 - 1st session (*Chairperson: Mª Luz Sánchez*)

- *"Use of oak extract as a natural antioxidant in burger patties".* **Marina Alarcón**. *Food Sciences and Technology.*
- *"Synthesis of polymeric scaffolds for drug delivery systems using supercritical $CO_2$".* **Irene Álvarez Lara**. *Chemical Engineering.*
- *"Optimized radiotherapy protocols delay the malignant transformation of low-grade gliomas in-silico".* **Araceli Henares Molina**. *Mathematics.*
- *"Synthesis of Pt(II) and Pt(IV) compounds as potential anticancer drugs".* **Jorge Leal Cruz**. *Inorganic Chemistry.*

18:15 - Break.

18:30 - 2nd session *(Chairperson: José Pérez)*

- *"Volatile and sensory characterization of La Mancha Malbec red wines".* **María Trujillo García-Rabadán***. Food Sciences and Technology.*
- *"Treating soil-washing polluted with lindane by electrolysis with diamond anodes".* **Martín Muñoz Morales***. Chemical Engineering.*
- *"Formation of secondary organic aerosol from the reaction of styrene with OH".* **Mercedes Tajuelo***. Physical Chemistry.*

- *"Substantially inhibition of FGF21 secretion by central leptin infusion in Wistar rats".* **Blanca María Rubio***. Biochemistry.*

## Thursday, 8th June 2017

09:30 - 3rd session *(Chairperson: Alberto Ramos*)

- *"Design and synthesis of organic field-effect transistors (OFETs)".* **Iván Torres Moya**. *Organic Chemistry*.
- *"Antioxidant capacity of Jabuticaba fruits".* **Michelly Paludo**. *Food Sciences and Technology.*
- *"Luminescent Zr-Based MOFs for Detection of Nitroaromatic Explosives".* **Mario Gutierrez**. *Physical Chemistry.*
- *"New Chiral N,N,O-scorpionate zinc alkyls as effective and stereoselective initiators for the living ROP of lactides".* **Sonia Sobrino Ramírez**. *Inorganic Chemistry.*

10:30 - Presentación de la Sección Territorial de la Real Sociedad Española de Química, **Dr. Julián Rodríguez López**.

10:45 - Coffee break.

11:30 - 4th sesión *(Chairperson: Ana Raquel de la Osa)*

- *"Magnetic/non-magnetic argan press cake nanocellulose for the selective extraction of sudan dyes in food samples prior to the determination by capillary liquid chromatography".* **Yassine Benmassaoud**. *Analytical Chemistry.*
- *"Catalyst synthesis for the electrochemical hydrogenation of cinnamaldehyde".* **Maria José Torres Gómez Calcerrada**. *Chemical Engineering.*
- *"Llaser spectroscopy and microscope of a new hof based on hexaazatriphenylene".* **Eduardo Gómez**. *Physical Chemistry.*
- *"Fabrication of nanoalumin/titanium dioxide modified screen printed carbon electrode for electrochemical detection of vanillin in food samples".* **Khaled Ali Murtada**. Analytical Chemistry.

12:30 - ***Invited Lecturer:*** **Prof. Julia Pérez Prieto** (Director of the "Group of Photochemical Reactivity", Instituto de Ciencia Molecular (ICMol), University of Valencia). ***"NIR-responsive smart nanohybrids based on lanthanide-doped nanoparticles"***.

13:30 - **OPENING CEREMONY** chaired by the Rector Magnificus of the University of Castilla-La Mancha **Dr. D. Miguel Ángel Collado Yurrita** and the Dean of the Faculty of Chemical Sciences and Tecnology **Dr. D. Ángel Ríos Castro**.

14:00-16:00 - Lunch break.

16:00 - **Invited Lecturer: Dra. Lourdes Amigo Garrido** (Group of Bioactivity and Allergenicity of Proteins and Food Peptides (BIOPEP), Consejo Superior de Investigaciones Científicas (CSIC), Instituto de Investigación en Ciencias de la Alimentación (CIAL)). *"Producción, biodisponibilidad y beneficios para la salud de péptidos lácteos".*

16:45 - 5th session: (Chairperson: Gema M. Durán)

- *"Current perspectives of the use from the castor (Ricinus communis) in México".* **Natali Gómez Falcón**. *Food Science and Technology*.
- *"From reactor to tumor".* **Enrique Niza González**. *Inorganic Chemistry.*
- *"Graphene quantum dots@Nafion modified glassy carbon electrode as an electrochemical sensor for the detection of sulphonamide residues in milk".* **Carina Gondim.** *Analytical Chemistry.*
- *"Steady-State, Fast and Ultrafast Spectroscopic Characterization of Drug Delivery Systems".* **Lorenzo Angiolini**. *Physical Chemistry*.

17:45 - Break.

18:15 - 6th session: *(Chairperson: Mª Luz Sánchez)*

- *"Unraveling the internal and surface photobehaviour of Nile Red interacting with a novel metal organic framework".* **Elena Caballero**. *Physical Chemistry.*
- *"Neuroprotective properties of beer compounds in cells".* **Patricia Alonso**. *Biochemistry.*

- *"Life cycle assessment of biomass thermochemical conversion processes".* **María Magdalena Parascanu**. *Chemical Engineering.*
- *"Kinetics of the depletion of CH3CH2OH by reaction with OH radicals at temperatures of interstellar dense molecular clouds (22-107 K)".* **Antonio Jesus Ocaña Fernández**. *Physical Chemistry.*

## Friday, 9th June 2017

9:30 - 7th session *(Chairperson: Sara López)*

- *"Physicochemical characterization and yield aspects in new table grape cultivars in subtropical areas".* **Ronan Carlos Colombo**. *Food Sciences and Technology.*
- *"Joining together Graphene and fullerene".* **Luis Miguel Arellano**. *Organic Chemistry.*
- *"Modified magnetic nanoparticles in the target analysis of some emerging pollutants".* **Feras Abujaber**. *Analytical Chemistry.*
- *"Agglomeration of nanoparticles for improved process safety using spray-drying".* **Jesús Alberto Martín del Campo Martín Consuegra**. *Chemical Engineering.*

10:30-Intervention by the Vice-Rector of Research of the UCLM, D. José Julián Garde López-Brea.

11:00 - Coffee break.

11:30 - 8th session *(Chairperson: Iván Torres)*

- *"Benefits of carbon nanotube based magnetic solid phase extraction in the selectivity of sample preparation for pollutants".* **Ana Isabel Corps**. *Analytical Chemistry.*
- *"Bioprospecting of agroindustrial residues from solid state fermentation with subsequent production and enzymatic purification".* **Isabel Zaparoli Rosa**. *Food Sciences and Technology.*
- *"Hypertermia-induced seizures affects the behavior in rats".* **Maria Crespo Gutiérrez**. *Biochemistry.*

- *"Bifunctional aluminum(heteroscorpionate) catalysts for the formation of cyclic carbonates from epoxides and carbon dioxide".* **Felipe de la Cruz Martínez.** *Inorganic Chemistry.*

12:30 - ***Invited Lecturer:*** **D. Feliciano Priego Capote** *(Analytical Chemistry Department, University of Córdoba),* ***"Análisis de Biomarcadores en Metabolómica Clínica".***

13:15 - *Colloquium chaired by Dean of the Faculty,* **D. Ángel Ríos Castro***, Manager of IRICA,* **Dña. Ester Vázquez Fernández-Pacheco** *and* **D. Feliciano Priego Capote** *(UCO).*

14:00 - Closing ceremony.

# CONFERENCIAS INVITADAS

**CI1**

## Los Fluidos Supercríticos en la Ingeniería Química

Enrique Martínez de la Ossa*

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Universidad de Cádiz

Ingeniería Química

De todas las sustancias que se pueden utilizar como fluidos supercríticos (FSC), las más usadas en procesos de Ingeniería Química son el dióxido de carbono y el agua. El $CO_2$-SC presenta unas extraordinarias propiedades de transporte y un elevado poder disolvente y se puede usar como medio de reacción en procesos químicos (p.e. transesterificación de triglicéridos para fabricar biodiesel) y como disolvente/ antisolvente en operaciones unitarias de separación, como extracción y precipitación. El $H_2O$-SC se usa como medio de reacción en dos procesos: la oxidación supercrítica (OASC), para la depuración completa de residuos orgánicos, tóxicos o peligrosos (que por ser muy exotérmica, es además generadora de energía), y la gasificación supercrítica (GASC), para la producción de gases combustibles con un alto contenido en Hidrógeno a partir de residuos lignocelulósicos.

**CI2**

# NIR-RESPONSIVE SMART NANOHYBRIDS BASED ON LANTHANIDE-DOPED NANOPARTICLES

Julia Pérez-Prieto*

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Organic Chemistry

Nanoparticles consisting of a matrix doped with rare earth ions can present upconversion luminescence after near-infrared (NIR) excitation. These upconversion nanoparticles (UCNPs) are interesting for biomedicine (biosensing, bioimaging), medicine (photodynamic therapy) photocatalysis, and security [1-3]. UCNPs are particularly promising in biomedicine since they can be excited by NIR light directly with much less absorption and scattering in tissues, resulting in deeper tissue penetration than visible light. These nanoparticles can be assembled with functional systems (dyes, polymers, drugs, etc.) following different strategies, thus providing functional nanohybrids benefiting from synergistic effects between the components. In this presentation, various strategies for modifying the surface of UCNPs and proof-of-concepts of their applicability will be presented [4]. For instance, $NaYF_4$: $Yb^{3+}$, $Er^{3+}$ UCNPs have been functionalized with photosensitizers, fluorophores, and functional polymers by either their direct interaction with the nanoparticle surface or by using a rigid macromolecule as the anchoring unit. Some of the resulting nanosystems have been assayed in photodynamic therapy as well as in strong acidic conditions showing the resistance of the assembly under these conditions and/or their potential application for building release systems.

*Acknowlegements:* We thank the Spanish Ministry of Economy and Competitiveness (CTQ2014-60174-P) and COST-CM1403 Action.

*References:*

[1] A. Gnach and A. Bednarkiewicz, Nano Today 2012, 7, 532; Y. Liu, D. Tu, H. Zhu, et al. Chem. Soc. Rev. 2013, 42, 6924.

[2] R. Arppe, T. Nareoja, S. Nylund, et al. Nanoscale 2014, 6 , 6837.

[3] J. Milliez, A. Rapaport, M. Bass, A. Cassanho and H. P. Jenssen, J. Display Technol. 2006, 2, 307.

[4] M. González-Béjar, M. Liras, L. Francés-Soriano, V. Voliani, V. Herranz-Pérez, M. Duran-Moreno, J. M. Garcia-Verdugo, E. I. Alarcon, J. C. Scaiano, J. Pérez-Prieto, J. Mater. Chem. B 2014, 2, 4554; M. Liras, M. González-Béjar, E. Peinado, L. Francés-Soriano, J. Pérez-Prieto, I. Quijada-Garrido, O. García, Chem. Mater. 2014, 26, 4014; L. Francés-Soriano, M. González-Béjar, J. Pérez-Prieto Nanoscale, 2015, 7, 5140; L. Francés-Soriano, M. Liras, A. Kowalczyk, A. Bednarkiewicz, M. González-Béjar, J. Pérez-Prieto, Nanoscale 2016, 8, 204; L. Francés-Soriano, S. Gonzalez-Carrero, E. Navarro-Raga, R.E. Galian, M. González-Béjar, J. Pérez-Prieto, Adv. Funct. Mat. 2016, 26, 5131.

**CI3**

# PÉPTIDOS LÁCTEOS CON FUNCIONALIDAD BIOLÓGICA: DEL LABORATORIO AL CONSUMIDOR

L. Amigo*, B. Hernández-Ledesma, B. Miralles, I. Recio

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Tecnología de Alimentos

Durante la digestión de los alimentos, se genera una gran variedad de péptidos a partir de proteínas alimentarias mediante hidrólisis enzimática. Algunos de estos péptidos son estructuralmente similares a los péptidos endógenos que juegan un papel crucial en el organismo como hormonas, neurotransmisores o antibióticos. Por lo tanto, los péptidos alimentarios pueden interactuar con los mismos receptores que los péptidos endógenos y ejercer un efecto agonista o antagonista en el organismo. Las funcionalidades biológicas beneficiosas de los péptidos derivados de la leche incluyen actividad antimicrobiana, antihipertensiva, inmunomoduladora, opioide, etc., aunque el nivel de evidencia para algunas de estas actividades es todavía escaso. Debido a su versatilidad fisiológica y fisicoquímica, los péptidos derivados de alimentos se consideran componentes altamente importantes para alimentos o aplicaciones farmacéuticas que promueven la salud. Sin embargo, el desarrollo de estos nuevos ingredientes debe basarse en criterios científicos capaces de demostrar inequívocamente sus propiedades biológicas.

Esta conferencia revisará nuestros últimos resultados sobre el desarrollo de ingredientes funcionales basados en péptidos bioactivos derivados de la leche, que ejercen principalmente una actividad antihipertensiva o con efecto sobre el tracto intestinal. Se prestará especial atención a la identificación de nuevas secuencias activas, la supervivencia de los péptidos a la digestión gastrointestinal, la absorción y la búsqueda de la forma activa en el organismo. Finalmente, se considerará la incorporación a los ingredientes desarrollados en un producto final, la estabilidad de los péptidos a los procesos tecnológicos aplicados en la industria alimentaria y la estabilidad durante la vida propia del producto. Para ilustrar estos aspectos, se mostrarán varios ejemplos de ingredientes. Por ejemplo, la identificación de nuevos péptidos antihipertensivos en un hidrolizado de caseína se presentará junto con la evaluación de la actividad en modelos animales y estudios clínicos.

**CI4**

## Análisis de Biomarcadores en Metabolómica Clínica

Feliciano Priego Capote*

Departamento de Química Analítica, Universidad de Córdoba, Instituto Maimónides de Investigación Biomédica de Córdoba, Hospital Universitario Reina Sofía, Universidad de Córdoba.

Química Analítica

El objetivo primordial de la metabolómica consiste en analizar el conjunto de compuestos de bajo peso molecular presentes en un fluido biológico, célula, tejido u organismo, en unas condiciones fisiológicas específicas o en respuesta a diferentes perturbaciones o estímulos. La metabolómica ha sido la última de las disciplina ómicas que integran la Biología de Sistemas (junto a la genómica, la transcriptómica y la proteómica) en ser desarrollada y, en este sentido, se ha aprovechado del camino recorrido por el resto de disciplinas mucho más establecidas.

Una de las áreas donde la metabolómica está empezando a jugar un papel primordial es la clínica ya que la metabolómica parece ser una herramienta adecuada para el desarrollo de herramientas de diagnóstico, pronóstico o cribado de pacientes. En este ámbito, el análisis de biomarcadores juega un papel clave siempre que se desarrolle con rigor experimental, analítico y estadístico. El protocolo genérico utilizado para el análisis de biomarcadores consta de tres etapas básicas que son: (a) diseño del estudio, con el fin de obtener datos finales representativos; (b) adquisición de datos mediante la aplicación del(los) método(s) de análisis; y (c) análisis estadístico.

Este esquema ha sido utilizado para el análisis y configuración de paneles de marcadores para la discriminación de individuos afectados por dos tipos de cáncer muy extendidos en la población española, el cáncer de prostata y el de pulmón. Para ello se seleccionaron dos muestras clínicas diferentes por sus características. En el caso del cáncer de próstata se utilizó la orina, ejemplo de muestra clínica convencional ampliamente utilizada. Para el cáncer de pulmón se utilizó el condensado de aire exhalado, muestra novedosa y poco caracterizada. En ambos casos se obtuvieron modelos de discriminación de pacientes caracterizados por altos niveles de sensibilidad y especificidad y, por tanto, con potencial para ser evaluados en una segunda fase con cohortes de mayor tamaño.

# PRESENTACIONES

**P1**

## USE OF OAK EXTRACT AS A NATURAL ANTIOXIDANT IN BURGER PATTIES

M. Alarcón*, L. Marchante, A. Soriano, M. S. Pérez-Coello

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Área de Tecnología de los Alimentos

The use of antioxidants in meat products is essential to delay or prevent oxidative phenomena that reduce their useful life. In this sense, there is a growing demand for the use of natural products in order to reduce the addition of chemical additives on food. Therefore, the aim of this work was to study the antioxidant capacity of lyophilized oak wood extracts added on hamburgers.

Five types of pork burger patties were prepared from a basic formulation. Control (C) was prepared with no added extract. The remaining 4 types were prepared by adding 400 ppm of sodium ascorbate (CA), and 0.5, 5 and 10 g/kg of lyophilized oak extract (R1, R2 and R3), respectively. The oak extracts were obtained by Accelerated Solvent Extraction (ASE) using water under subcritical conditions, previously optimized. The samples were packaged in modified atmospheres (80% $O_2$ and 20% $CO_2$) and stored at 4-5 ° C with a 12 h/day light exposition. The lipid oxidation was determined by the thiobarbituric acid reactive substances content (TBARS), the volatile composition was evaluated by GC-MS; and color (L*, a*, b*), pH and moisture analysis were performed; sampling at 0, 4, 8 and 12 days.

An intense inhibition of lipid oxidation was found in burger patties with added extract. This antioxidant activity was effective immediately after the extract addition to the samples (0 days). Furthermore, the antioxidant activity of the extracts was reflected in the volatile composition of the burger patties, observing a smaller amount of typical compounds of lipid oxidation such as hexanal and other aldehydes. The L* values decreased as the extract concentration increased, and the a* and b* values were similar among all samples. A significant decrease in pH values was observed between 8 and 12 days in all samples. There were not significant differences for moisture between samples.

Therefore, the incorporation of a concentration equal or greater than 0.5 g/kg of lyophilized extract of oak wood protects from lipid oxidation more effectively than sodium ascorbate in pork burger patties.

**P2**

# SYNTHESIS OF POLYMERIC SCAFFOLDS FOR DRUG DELIVERY SYSTEMS USING SUPERCRITICAL $CO_2$.

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Área de Ingeniería Química

Polymers can be used as biomaterials in order to synthesize scaffolds for tissue engineering and medical devices in the field of regenerative medicine. They are selected for many different biomedical applications depending on their molecular weight, structure, solubility, biodegradability or hydrophilicity/hydrophobicity[1]. In addition to this, they are capable to integrate other substances which promote tissue growth or even drugs for the synthesis of controlled release systems, either microparticles or scaffolds/foams. Controlled drug delivery occurs when a polymer and a drug are combined in a way that the active agent is released from the material in a predesigned manner: constant over a period that varies from hours to months, cyclic or it could be provoked by a change in pH, temperature or drug concentration.

Techniques to produce drug delivery systems such as emulsion, spray-drying or solvent evaporation have disadvantages in relation with total solvent removal. This problem is solved by the employment of supercritical fluids (SCFs)[2]. Among the most important reasons to use SCFs are: SCFs leads to the complete solvents elimination, the formation of smaller particles and the control of pore size, distribution and morphology of the foams. Moreover, by using SCFs it is possible to carry out drug impregnation in a clean and efficient way. The most commonly used SCF in this field is $CO_2$.

The aim of this research is to synthesize medical devices for drug delivery by using Poly (lactic-co-glycolic acid) (PLGA).This polymer is interesting because it has good biodegradability and biocompatibility and it is toxicological safe. The investigation has been focus on the generation of this devices in two different ways: micro and nanoparticles and microcellular foams.

References

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2. Reverchon, E.; De Marco, I.; Torino, E.; *Journal of Supercritical Fluids.* **2007**, *43*, 126-138.

**P3**

# Optimized radiotherapy protocols delay the malignant transformation of low-grade gliomas *in-silico*

**A. Henares-Molina[1,*], S.Benzekry[2], P.C. Lara[3], M. García-Rojo[3], V.M. Pérez-García[1] and A. Martínez-González[1]**

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Grade II gliomas are slowly growing primary brain tumors that affect mostly young patients and become fatal only several years after diagnosis. Cytotoxic therapies such as radiotherapy and/or chemotherapy are used initially only for patients having a bad prognosis. These therapies are planned following the "maximum dose in minimum time" principle (Maximum Tolerated Dose, or MTD paradigm), the same schedule used for high-grade brain tumors in spite of their very different behavior. These tumors transform after a variable time into high-grade tumors, what decreases significantly the patient's life expectancy. The incurable profile of this disease motivated us in using mathematical models in order to maximize the time to the malignant transformation through the optimization of radiotherapy schemes.

A series of previous studies [1,2] has developed a PDEs model describing the basic features of grade II glioma progression and response to radiotherapy. We found the model predicted that there was a much more effective fractionation scheme, protracted metronomic fractionations [3], i.e. therapeutical schedules enlarging the time interval between low-dose radiotherapy fractions, may lead to a better tumor control without an increase in toxicity. Other non-standard fractionations such as protracted or hypoprotracted schemes may also be beneficial. The potential survival improvement depends on the tumor proliferation rate and can be even of the order of years. A conservative metronomic scheme, still being a suboptimal treatment, delays the time to malignant progression of at least one year when compared to the standard scheme.

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**P4**

## Synthesis of Pt(II) and Pt(IV) compounds as potential anticancer drugs.

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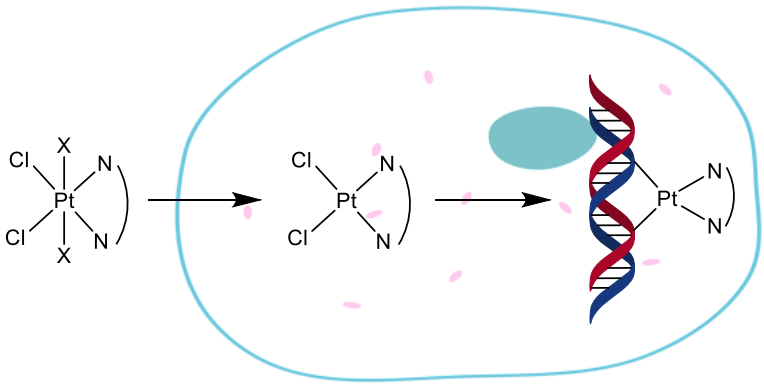
Inorganic Chemistry

Pt(II) Organometallic compounds have been widely used in cancer treatment. Cisplatin is one of the most successful and widely used drug against many types of cancer. However, its poor selectivity towards tumour cells lead to undesirable side effects. Pt (IV) compounds have properties that help to overcome these problems.

Pt(IV) compounds are more stable, leading to higher lifetime and lower side effects. . These compounds act as a pro-drug, being reduced inside the cell to their Pt (II) analogs, which are the ones that have cytotoxic activity. These Pt(II) drugs usually bind covalently to the DNA double helix, starting cell death by apoptosis.

In our group we synthesize Pt(II) and Pt (IV) coordination compounds with different chelating ligands. Chelating ligands have been used in order to force the cis configuration in the complexes, which is known to have best cytotoxic properties. The use of different ligands is useful to tune up the properties of the compounds, achieving more soluble and stable drugs.



**P5**

## VOLATILE AND SENSORY CHARACTERIZATION OF TINTO DE LA PAMPANA BLANCA RED WINES

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Tecnología de Alimentos

**Background and Aims:** This study characterizes the oenological potential of Tinto de la Pámpana Blanca red wines from La Mancha region.

**Methods and Results**: The oenological potential of these wines was characterized by their conventional parameters, phenolic composition, chromatic characteristics volatile composition and sensory analysis. With regard to the concentration of polyphenol compounds all the studied wines had normal values to be considered young red closely connected with their colour characteristics. Based on the volatile compounds profile these wines presented a complex chemical profile with a wealth of aromas in its aromatic composition. All wines showed highest aroma contribution of the fruity and fatty series followed by sweet. Sensory profile of Tinto de la Pámpana Blanca wines was caracterized by red friut, liquorice, leather, coffee and Green aromas with floral notes

**Conclusions:** This study showed that this grape variety provides a viable alternative to traditional grape varieties cultivated in La Mancha region, increasing the offer to the consumer, which favors the differentiation of La Mancha wines on the national and international market.

**P6**

# TREATING SOIL-WASHING POLLUTED WITH LINDANE BY ELECTROLYSIS WITH DIAMOND ELECTRODES

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In last years, the removal from soils of hazardous species is an environmental priority in order to avoid the further magnification of the problem with the later pollution of water reservoirs. In this work, it is studied the treating of soils polluted with lindane using surfactant-aided soil-washing (SASW). Lindane has been banned in Europe due to the problems that generate in the environment and on human health. Regarding to this, the removal of lindane from solvents has been faced with different AOPs technologies [1-3] but in this work, it is evaluated the complete treatment of polluted soils.

Fluids generated in SASW process consist of complex mixtures of surfactant SDS, lindane and micelles whose composition (and size of micelles) depends on the surfactant/soil ratio applied. Results show that lindane in the washing fluid can be efficiently mineralized during the electrolysis with diamond electrodes and also was observed the generation of an intermediate during this mineralization. Micelles particle size decreases continuously during the treatment down to the mean size of soil particles and SDS oxidation lead to the formation of sulfates that, in turn, are further oxidized to persulfate, showing a key role on the performance of the treatment technology. In addition, two different stirring conditions were evaluated after detecting an important effect in the results of lindane extraction. The removal of lindane is faster than SDS, and hence, the re-use of the surfactant in the SASW process can be proposed.

Acknowledgements

The authors acknowledge funding support from the European Union and Spanish Government through MINECO Project Sustertech4CH (CTM2016-76197-R).

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**P7**

# FORMATION OF SECONDARY ORGANIC AEROSOL FROM THE REACTION OF STYRENE WITH OH

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Air pollution is one of the most serious environmental problems at local and global scales. A wide spectrum of inorganic and organic chemical compounds are emitted from automotive use, from combustion to evaporative processes. They include the obvious water vapor and carbon dioxide ($CO_2$), as well as carbon monoxide (CO), oxides of nitrogen ($NO_x$), oxides and oxyacids of sulfur, reduced sulfur compounds, a wide variety of volatile organic compounds (VOCs) and particulate matter. [1] Styrene is one of the most aromatic compounds emitted by motor vehicles. [2] Because of its unsaturated characteristics, styrene is highly reactive in the atmosphere, and can be attacked readily by reactive oxygen species, such as hydroxyl radical (OH), $O_3$, and nitrate radical ($NO_3$). [3] This results in secondary pollution like secundary organic aerosol (SOA). [4] SOA not only impoverishes air quality but also has an impact on climate via scattering and, absorption of light as well as aerosol-cloud interactions. [5]

In this work, SOA formation from the photooxidation of styrene has been investigated. The overall aim of this study was to perform a series of experiments under a range of different reaction conditions (varying styrene, radical OH, NOx concentrations and relative humidity) in order to measure the SOA formation yield.

Experiments were performed in a 500 L Teflon environmental chamber. A Fast Mobility Particle Sizer (FMPS) spectrometer was used to measure of SOA, the styrene concentration was monitored by using gas chromatography-mass spectrometry (GC-MS), and the NOx evolution was followed by a chemiluminescence analyzer.

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**P8**

# SUBSTANTIALLY INHIBITION OF FGF21 SECRETION BY CENTRAL LEPTIN INFUSION IN WISTAR RATS

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Leptin and fibroblast growth factor 21 (FGF21) were introduced as adipokines with potent antidiabetic properties. Leptin, a hormone derived from white adipose tissue, is one of the major signals that relay the status of fat stores to the hypothalamus and plays a significant role in energy homeostasis. FGF21 is a member of the fibroblast growth factor family of proteins, mainly secreted by liver and adipose tissue. FGF21 was originally found to stimulate insulin-independent glucose uptake in adipocytes. Circulating levels of both hormones leptin and FGF21 have been shown to correlate positively with body mass index (BMI), hence, obese and overweight individuals have usually high levels of leptin and FGF21 and develop insulin resistance. Indeed it has been proposed that obesity is a state of leptin and FGF21 resistance. Nevertheless, the real physiological significance of circulating FGF21 remains to be elucidated. Studies from our laboratory indicated that hypothalamic leptin administration reduced the ability of adipose tissues to capture glucose, hence, central leptin decreased lipogenesis and adiposity. Based on these observations, we hypothesized that central leptin decreases the secretion of FGF21 by adipose tissues. In this manner, central leptin reduces glucose uptake in adipocytes. In addition we suggest that the increase in FGF21 levels that accompanies obesity may be due to impaired hypothalamic regulation of adiposity and FGF21 secretion by central leptin.

**P9**

## DESIGN AND SYNTHESIS OF ORGANIC FIELD-EFFECT TRANSITORS (OFETs)

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Organic Chemistry

In the last years, organic electronic has attracted great attention due to the development of semiconductor materials. These materials have practical applications in the latest generation device, like OLEDs, OFETs, Liquid Crystal, etc. Organic field-effect transistors (OFETs) are devices formed with an organic semiconducting layer, a gate insulator layer, and three terminals (source, drain and gate electrodes). [1] OFETs are essential building blocks for the next generation of cheap and flexible organic circuits. Additionally, they also provide an important insight into the charge transport of $\pi$-conjugated systems.

To design an OFET with good properties, organic chemistry plays an important role, studying the most accurate characteristics of desired organic compounds. Furthermore, an important fact in this research is the theoretically study of their properties to avoid unnecessary synthesis. For this goal, computational chemistry is a crucial tool to evaluate their properties without synthesizing them. In this sense, computational calculations can be used to the determination of the energy and topology of frontier molecular orbitals, calculations of oxidation-reduction potentials, Raman spectra, reorganization energies and theoretical UV-vis spectra. [2]

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**P10**

## ANTIOXIDANT CAPACITY OF JABUTICABA FRUITS

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Food Science and Technology

Brazil is recognized by your unique biodiversity, which includes a diversity of native fruits, like Jabuticaba. This fruit is rich in several components, like phenolic compounds and mainly the class of anthocyanins, which have high antioxidant capacity and are associated with the prevention of diseases such as cancer, heart disease, premature aging and others. Methodologies have been developed in order to evaluate the capacity of vegetable extracts in oppose free radicals that are normally produced by human metabolism as $H_2O_2$, $O_2\bullet^-$, HOCL, $ONOO^-$ e $ROO^-$. Thereby, in this work, the deactivation capacity of radicals ROS (oxygen reactive species) and RNS (Reactive nitrogen species) present in peels and seeds extracts of five Jabuticaba varieties were evaluated. The evaluated varieties were Myrciaria jaboticaba (Vell.) O. Berg (Sabará), Myrciaria cauliflora (DC.) O. Berg (Paulista), Myrciaria coronata Mattos (Coroada), Myrciaria cauliflora (DC.) O. Berg (Hibrida) and Plinia ssp. (Pintada). ROS and RNS were evaluated using the method as hypochlorous acid-scavenging, peroxynitrite-scavenging, superoxide radical-scavenging, hydrogen peroxide-scavenging and oxygen Radical Absorbance Capacity. The mainly results were: deactivation of HOCL in extract of peel Sabará (IC50 9,24 $\mu g.mL^{-1}$), $O_2\bullet^-$ in extract of seed Paulista (IC50 16,15 $\mu g.mL^{-1}$), $ONOO^-$ without $NaHCO_3$ in extract of peel Coroada (IC50 3,84 $\mu g.mL^{-1}$), and with NaHCO3 in extract of peel Coroada (IC50 5,88 $\mu g.mL^{-1}$), $ROO^-$ in extract of peel Sabará (918,16 µmol TE $g^{-1}$) and for of $H_2O_2$ in extract of seed SF (49,11% Inhibition in the concentration of 125 µg extract.$mL^{-1}$). The results show up that Jabuticaba fruit can be considered as an excellent source of exogenous antioxidants and also can be useful as data base for development of new products by food, cosmetic and pharmaceutical industries. Moreover, the results indicated that these fruits could be included in the population diet, in order to assist in the prevention of several chronic diseases.

## P11

# Luminescent Zr-Based MOFs for Sensing and Optoelectronic Applications

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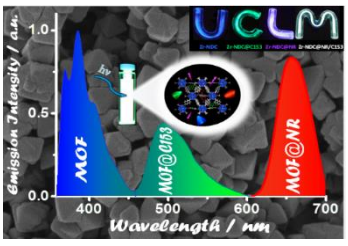
Physical Chemistry (Spectroscopy of Nanomaterials)

Metal-Organic Frameworks (MOFs), a class of highly porous and crystalline compounds, have aroused as smart materials with a wide range of uses and applications. Among all, their excellent luminescence properties combined with their porous structure and synthetic flexibility, make them ideal candidates for solid-light emitting and chemical sensing applications.[1] The photophysical characterization of MOFs is paramount not only to improve the synthesis of more efficient MOF materials, but also for their implementation in the related fields.[2-6] Herein, armed with spectroscopic and ultrafast time-resolved techniques, we decipher the spectral and photodynamical behavior of a series of Zr-MOFs and dyes@MOF composite materials as well as we demonstrate their applications as light emitting diode (LED)[5] and luminescent sensor.[6] We show that the Zr-NDC MOF emission is due to NDC monomers and excimers.[3] By encapsulating different dyes (C153, DCM and NR) into Zr-NDC MOF, we observed an energy transfer process from the MOF to the dyes, and we used this concept to fabricate white light emitting materials (Figure 1A). [2] These composites were incorporated into polymeric films which allow us to fabricate the first OLED based on Zr-MOFs. [4,5] On the other hand, we have also explored the photoproperties of Zr-NDC/Tz and Zr-NDC/CN MOFs, demonstrating that both MOFs detect efficiently and selectively a highly explosive molecule (trinitrophenol, Figure 1B).[6] These results evidence the importance of spectroscopic investigations for further applications of MOFs.



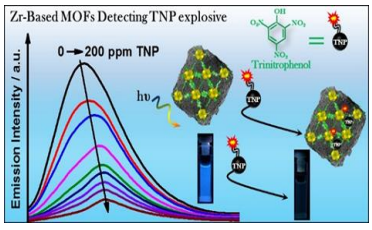




**Figure 1.** A) White light emission of Zr-NDC MOF containing C153 and NR dyes. B) Emission quenching of Zr-NDC/Tz MOF in presence of TNP explosive molecules.

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**P12**

# NEW CHIRAL N,N,O-SCORPIONATE ZINC ALKYLS AS EFFECTIVE INITIATORS FOR THE LIVING ROP OF LACTIDES

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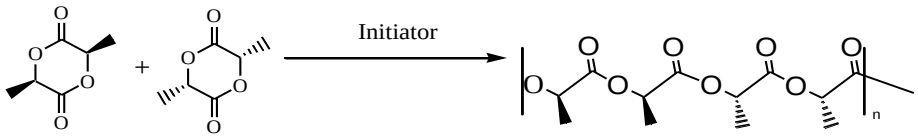
During the last years, our research group has contributed widely in the preparation of efficient catalysts bearing heteroscorpionte ligands derived from bis(pyrazol-1-yl)methane moieties for the preparation of biodegradable polymers by a well-controlled ring-opening polymerization (ROP) of cyclic esters, such as lactide (LA), an inexpensive annually renewable natural feedstock.[1] The biocompatible nature of the polylactides (PLAs) have attracted our attention, and consistently, we have employed biocompatible metals such zinc for the design of these catalysts.
In the present work, we described the synthetic accessibility of zinc metal complexes bearing a racemic NNO-scorpionate ligands, as well as their catalytic behavior as single-component initiators for the efficient and stereoselective ROP of *rac*-lactide in the production of heterotactic-enriched polylactides.[2]




D + L lactide poli(lactide)

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**P13**

## Magnetic/non-magnetic argan press cake nanocellulose for the selective extraction of sudan dyes in food samples prior to the determination by capillary liquid chromatography

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Analytical Chemistry

Sudan dyes are a class of azo dyes widely used in the chemical industry as coloring materials. Due to their intense red color and low price, these compounds have illegally been used as food dyes to intensify the color. Although the use of Sudan compounds, as food dyes, has been banned by the European Community [2].

In this contribution, two methods for the determination of Sudan dyes in food samples, by solid phase extraction - capillary liquid chromatography, are developed. Both methods use nanocellulose (NC) extracted from bleached argan press cake (APC), as a nano-adsorbent recycled from an agricultural waste material. One of the methods involves the dispersion of NC in food sample extracts, along with the waste and eluents being separated by centrifugation. In the other method, NC was modified by magnetic iron nanoparticles before using it in the extraction of Sudan dyes. The two proposed methods allows the determination of Sudan dye amounts at the 0.25–2.00 μg L−1 concentration range, with limit of detections lower than 0.1 μg L−1. Both methods were applied to the determination of Sudan dyes in barbeque and ketchup sauce samples, obtaining recoveries between 93.4% and 109.6%.

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## P14

# CATALYST SYNTHESIS FOR THE ELECTROCHEMICAL HYDROGENATION OF CINNAMALDEHYDE

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The selective hydrogenation of α, β-unsaturated aldehydes such as cinnamaldehyde (CMA) to their respective unsaturated alcohols is a problem that has received considerable attention due to its utility in the flavours, fragrances and pharmaceutical industries. This process could be carried out by heterogeneous catalysis, which is a typical example of ecologically friendly technologies against homogeneous catalytic process[1]. The hydrogenation of CMA mainly produces its saturated aldehyde, hydrocinnamaldehyde (HCMA) that has been found to be an important intermediate in the preparation of pharmaceuticals used in the treatment of HIV, and its unsaturated alcohol, cinnamyl alcohol (CMO), which is widely used in the production of perfumes[2] . Since the formation of HCMA is thermodynamically preferred and can be achieved easily compared to CMO, more attention has been focused on promoting the selectivity towards the unsaturated alcohol.

On the other hand, Proton Exchange Membrane (PEM) cells are actually a promising reactorsfor water electrolysis, providing a sustainable solution for highly pure hydrogen production at the anodic chamber, and protons that pass through the membrane offers the possibility of carry out the selective hydrogenation of unsaturated organic compounds inside the PEM cell cathode[3] .

Therefore, this study was focused on the influence of the cathodic Platinum catalysts on the electrochemical hydrogenation of cinnamaldehyde in order to maximize the selectivity to valuable product, especially cinnamyl alcohol.

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## P15

# LASER SPECTROSCOPY AND MICROSCOPE OF A NEW HOF BASED ON HEXAAZATRIPHENYLENE

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Hydrogen-bonded Organic Frameworks (HOFs) are currently attaching interest in the fields of materials chemistry and crystal engineering due to its high crystallinity and theirs applications in optoelectronic devices. [1] In this work, a new HOF based on a heterocyclic π-conjugated system, the hexaazatriphenylene (HAT), is studied. To resolve the photobehaviour of the crystalline framework (CPHAT-1a) it is necessary first to understand the photodynamics of its fundamental unit, CPHAT, Figure 1A. The photobehaviour of this molecule was studied by using steady-state and time-resolved spectroscopy in DMF solutions. A Stokes shift (4650 $cm^{-1}$) was observed suggesting that an intramolecular charge transfer (ICT) in the excited state is happened, Figure 1B. Four decay components of 70 ps, 0.23, 1.00 and 4.90 ns were found in the time-resolved emission decays. The shortest component one is assigned to an intermolecular proton transfer reaction (PT), after the ultrafast ICT (<15 ps), to generate an anion species that relax to the ground state in 4.90 ns. The intermediate components are assigned to the initially emission lifetimes of the excited CPHAT (0.23 ns) and to the charge transfer species (TC, 1.00 ns). Fluorescence microscopy study at single crystal level in solid state was also performed, revealing an ordered crystalline structure with preferential orientation of the molecular dipole moments, Figure 1C.

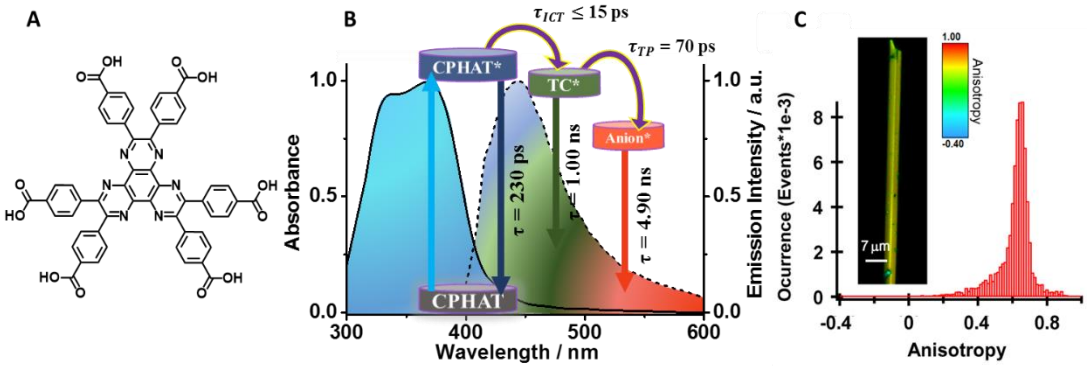


**Figure 1. A)** Scheme of CPHAT. **B)** Absorption and emission spectra of CPHAT in DMF solutions. **C)** Dependence of the emission anisotropy on the orientation of single crystal of CPHAT-1a.

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**P16**

# FABRICATION OF NANO-ALUMINUM/TITANIUM DIOXIDE MODIFIED SCREEN PRINTED CARBON ELECTRODE FOR ELECTROCHEMICAL DETECTION OF VANILLIN IN FOOD SAMPLES

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Analytical Chemistry

A new chemically modified electrode based on aluminium nanoparticles (Al-NPs) has been constructed. Titanium was incorporated into the Al-NPs to prepare titanium oxide doped nano-aluminium. Titanium oxide/nano-aluminium screen printed carbon electrode ($TiO_2$/Al-NPs-SPCE) was employed as simple, efficient and rapid sensor for electrochemical detection of vanillin in various types of food samples. $TiO_2$/Al-NPs were characterized by X-ray diffraction (XRD) and transmission electron microscopy (TEM) analyses showing that the average particle sizes varied for the Al-NPs (7.63 nm) and $TiO_2$/Al-NPs (7.47 nm) with spherical crystal. The liner sweep voltammetry (LSV) and cyclic voltammetry (CV) were used to optimize the analytical procedure and a detection limit of 0.985 µM for vanillin was found. A relative standard deviation of 2.09 % was calculated for a 250 µM concentration of vanillin. The electrochemical behavior of other compounds (vanillic acid, vanillic alcohol, p-hydroxybenzaldehyde and p-hydroxybenzoic, etc.), generally present in natural samples, were also studied, to check the interferences with respect to vanillin voltammetric signal. To validate the methodology and efficacy of proposed sensor, detection of vanillin was also examined in food samples. The obtained results were compared with those provided by a reference method based on liquid chromatography.

## P17

## CURRENT PERSPECTIVES OF THE USE FROM CASTOR (*Ricinus communis*) IN MEXICO

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Biotecnología Agroindustrial

Since 2008, the National Research and Technological Transfer System for Sustainable Development (SNITT, Mexico) has established an added value for crops and co-products used in bioenergetics, through, the use of crops that do not jeopardize the country's food security.

The castor (*Ricinus commnunis*), is an evergreen shrub of the euphorbiaceous family, of fast growth, growth of wild form and in Mexico it is considered weed, due to its rapid propagation in any type of soil. It grows in most climates, is obtained at low cost, has a great tolerance to the environment and its annual production exceeds one million tons. Its main use was medicinal, currently is used how ornamental plant and for the production of industrial oils in several countries of the world. Economically, castor is a crop that contributes nearly 1.0% of the world's total production of oilseeds. However, ingestion of the seeds causes severe intoxication and can be fatal (0.18 g / kg mass), because they contain a toxin called ricin. In this situation, different types of detoxification have been proposed, such as chemical, biological, enzymatic or thermal treatments.

In Mexico the interest for the use from castor as industrial crop, it's due to high content of oil (40-50% from seed weight). In this sense, the oil is used in the manufacture of lubricants, plastics, soaps, hydraulic liquids, paints, varnishes and recently it is promoted for the production of biodiesel. These attributes increase their possibilities as an alternative crop in the oil supply for different types of industries. However, as by-product of the extraction of oil, a product known as castor cake is generated, that once detoxified is used mainly as fertilizer and as a source of protein for the production of feed for livestock. Some studies verify the possibility of its use for human consumption. Another use that is arousing interest in the country is the use of biomass for biofuel purposes. The perspectives of use of this species in Mexico and worldwide have diversified to a large extent, since it has begun to be used as a phytoremediation agent and as biological control agent. However, research continues to grow in the improvement of methods of simultaneous extraction and detoxification, as well as in improvement of methods of elimination of the toxin.

**P18**

# FROM REACTOR TO TUMOR

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Química Inorgánica

Drug delivery system (DDS) is the method or process of administering a pharmaceutical compound to achieve a therapeutic effect in humans or animals. DDS allows to decrease the number of doses and to maintain effective for long periods of time without reaching toxic levels, which achieves an improvement in the patient's comfort.

A series of alkyl organoaluminium initiators based on heteroscorpionate ligands have been prepared to increase the catalytic activity in Ring-Opening Polymerization (ROP) of *ε*-caprolactone without sacrificing control over the $M_w/M_n$.[1] The easy-to-make polycaprolactones of controlled molecular weight and molecular weight distribution were chosen to manufacture biodegradable devices for drug delivery. Amongst the different formulations evaluated, porous polycaprolactone microspheres showed interesting advantages for application as doxorubicin delivery systems. Finally, a copolymer of *ε*-caprolactone and *L*-lactide has been designed, which displayed a pH-independent mechanism of doxorubicin release.

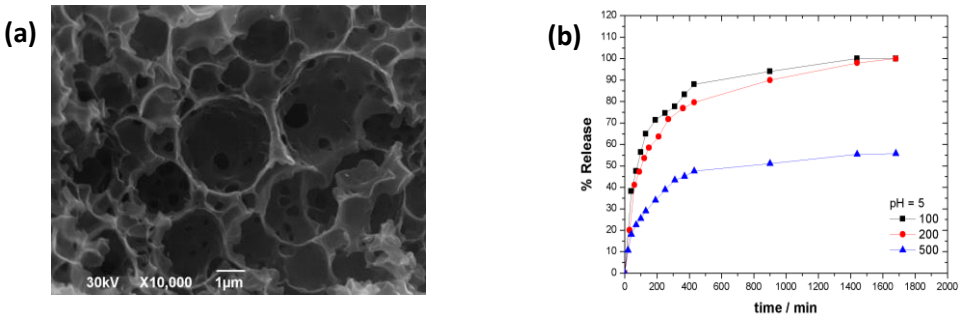


**Figure 1**. (a) SEM micrograph of PCL-FIII, 10000X. (b) DOX-released profile for PCL-FIII at pH=5

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**P19**

# DEVELOPMENT OF A SCREENING METHOD FOR DETECTION OF SULPHONAMIDE RESIDUES USING AN ELECTROCHEMICAL SENSOR

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Química Analítica

The objective of this work was to propose a screening method based on electrochemical measurements that could be applied in detection of sulphonamide residues in milk samples, using a graphene quantum dots modified glassy carbon electrode (G-QDs@Nafion/GCE) for improving sensitivity. After optimization, the qualitative method was validated. The performance parameters estimated were false positive, false negative, selectivity and sensitivity rates; accordance, concordance, unreliability region, detection limit and selectivity in presence of potential interferents. Six sulfonamides were evaluated: sulfadimethoxine, sulfadiazine, sulfamethazine, sulfamethoxypyridazine, sulfapyridine and sulfathiazole. Sulphonamide standard solutions at concentrations between 25 and 150 μg $L^{-1}$ were analyzed. The electrochemical technique employed was differential pulse voltammetry. The G-QDs@Nafion/GCE demonstrated satisfactory values for repeatability, reproducibility and stability; with a significant increase on the sensitivity comparing with the glassy carbon electrode. A satisfactory performance related to the false-positive results and precision (accordance and concordance values) was observed. The selectivity was demonstrated for potassium chloride, magnesium sulfate, calcium chloride, sucrose, citric acid and lactose. However, the antimicrobial oxytetracycline was considered a interferent. Sulphonamides were detected at the maximum residue limit (MRL) recommended by the Codex Alimentarius for sulfamethazine (25 μg $L^{-1}$) and at the MRL established by the European Union for the sum of sulphonamides in milk (100 μg $L^{-1}$). These results demonstrated the potential applicability of the developed method in detection of sulphonamides residues in milk samples.

**P20**

# FLUORESCENCE-LIFETIME IMAGING MICROSCOPY OF CLOFAZIMINE WITHIN MESOPOROUS SILICA PARTICLES

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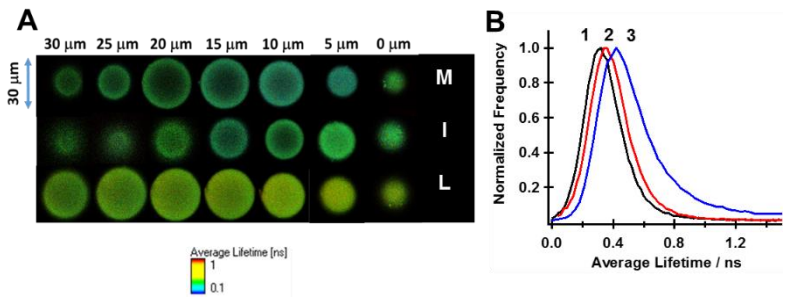
Confocal microscopy, UV-Vis spectroscopy

Clofazimine (CLZ) is an antibiotic recommended as primary agent by the World Health Organization for the treatment of leprosy and it is also active against mycobacteria and various Gram-positive bacteria. The low solubility (10 mg/L) in water decreases CLZ bioavailability and triggers its crystallization in the body tissues, which is the cause of various side effects. Mesoporous silica particles (MSP) are stable and biocompatible drug delivery systems able to successfully improve the loading, stability and bioavailability of CLZ. In this work, we characterized the distribution of CLZ within MSP pores with hydrophilic and hydrophobic (low concentration of Si-OH groups) surfaces and studied their effect on CLZ spectroscopic properties. A combination of Fluorescence lifetime imaging (FLIM) microscopy, Time correlated single photon counting and UV-Vis spectroscopy techniques showed a CLZ concentration quenching effect on its emission intensity and emission average lifetime. CLZ presented a stronger quenching effect when encapsulated in the hydrophobic MSP, due to its high affinity for the hydrophobic pores that could retain higher amount of CLZ. This was observed in shorter emission lifetime (0.5 ns), compared to the CLZ within hydrophilic particles (1.2 ns). These findings provide useful information to design MSP delivery systems in order to control the release of CLZ, while increasing the bioavailability without affecting its stability.



**P21**

# UNRAVELING THE INTERNAL AND SURFACE PHOTOBEHAVIOUR OF NILE RED INTERACTING WITH A NOVEL METAL ORGANIC FRAMEWORK

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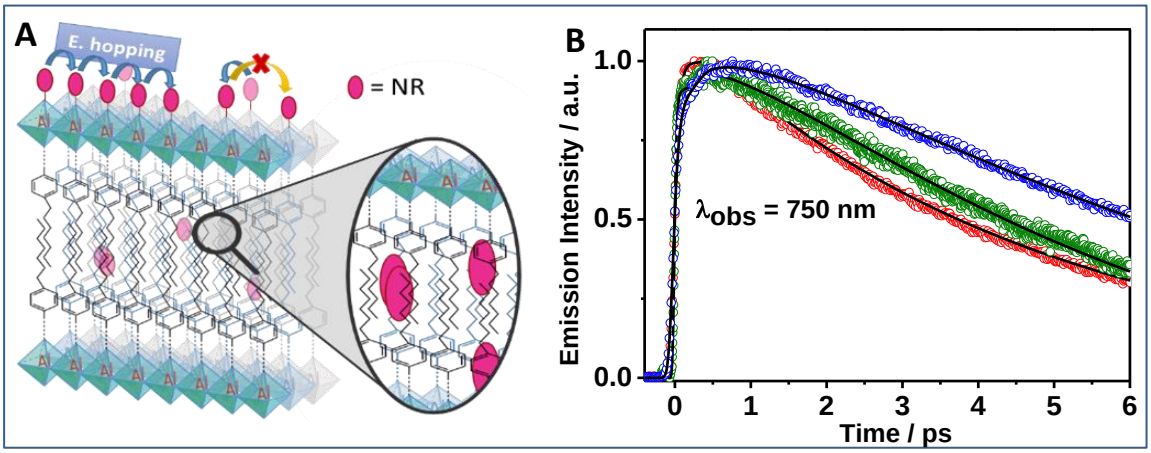
In this communication, we unravel the photodynamics of Nile Red (NR) interacting with ITQ-HB, a new layer-structured Metal Organic Framework (MOF) with potential catalytic and photonic applications.[1] This MOF is formed by an oxide metal (Al) cluster and heptane benzoic acid (HB) as linker (Scheme A). Steady-state and time-resolved observations show that the NR behaviour interacting with this MOF is dictated by its location in the material, showing remarkable differences in the photophysical processes when the dye is inside or on the surface of the MOF. A broad absorption band reveals the presence of several species in the ground state, while a narrow emission band indicates processes occurring in the excited state. Furthermore, the time-resolved emission experiments provide more details on the photodynamics of the dye (Scheme B). Our data suggest the occurrence of energy hopping processes,[2] leading to shorter emission lifetimes when the NR concentration increases. Our results shed new light on the photodynamics of a new composite and open the door to further researches of encapsulation of relevant molecules within this material, a better understanding of photocatalysts and photonic processes with MOFs.




(A) Schematic representation of NR distribution and its dynamics when interacting with Al-ITQ-HB. (B) Emission decays of NR@Al-ITQ-HB observed at 750 nm and excited at different wavelengths: 470 nm (blue circles), 550 nm (green circles and 635 nm (red circles).

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**P22**

## NEUROPROTECTIVE PROPERTIES OF BEER COMPOUNDS IN CELLS

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Ciencias de la Salud

Alzheimer and Parkinson are the main neurodegenerative diseases in the elderly. Together with these pathologies, cancer and cardiovascular diseases constitute the major challenge in our society. Although causes of Alzheimer and Parkinson diseases are unknown, excitotoxicity and oxidative stress seem to be involved. However, a good nutrition and the intake of several nutrients have showed beneficial effects and they can reduce the probability of developing these pathologies, or slow down its progression. Moderate consume of alcoholic drinks, like wine or beer, have benefit effects in cancer or cardiovascular diseases. However, there are few studies about beer consume and neurological diseases. Benefits of beer can be due to the wide kind of compounds present in this beverage as antioxidants, polyphenols or flavonoids. Previous results of our group have shown altered levels of receptors implicated in memory and neuromodulation, as metabotropic glutamate (mGluRs) or adenosine receptors (AdoRs). In Alzheimer disease, mGluRs are decreased with the illness progression while AdoRs are increased since early stages which are asymptomatic. For this reason, these receptors and other related metabolites have been studied in two cellular models, C6 glioma and SH-SY5Y neuroblastoma cells which have been subjected to different insults related to AD (oxidative stress, excitotoxicity...) and the effect of beer (extract of beer, hop and polyphenols) was studied. Viability results show cell death due to these insults and a recovery of life cells after beer exposure. On the other hand, gene expression of receptors which are altered in AD was modified in cells after treatment with beer. These results demonstrate a protective effect of beer in these cell cultures and the ability of beer to modulate the expression of these GPCRs, suggesting that a moderate consume of beer could be protective versus oxidative stress and other factors associated to neurodegeneration.

**P23**

## Life cycle assessment of biomass thermochemical conversion processes

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Area of Chemical Engineering

In recent years, there has been an increasing interest in valorisation of biomass to produce useful fuels and chemicals. Biorenewable feedstocks can be used as solid fuel or converted into gaseous or liquid forms in order to produce energy, chemicals, heat or gaseous or liquid fuels. Biomass conversion can be carried out through a wide range of processes. The most important thermochemical conversion processes of biomass to useful end products are: pyrolysis, combustion and gasification [1].

The set of all inputs of raw material and energy and the outputs of waste and emissions constitutes the environmental impact of the product. Life cycle assessment (LCA) is a very useful tool to evaluate different impact categories quantitatively and qualitatively involved in life cycle of the end products [2]. The SimaPro software is a professional tool to evaluate the environmental impacts of products, processes and services throughout their life cycle.

Taking into account all these aspects, this work aims to identify the environmental impacts generated by the production of various products (char, gas, energy, etc.) through the thermochemical processes using as raw material different types of biomass such as olive pomace, castor husk, castor stems, agave bagasse, pinus sawdust, coffee pulp etc.

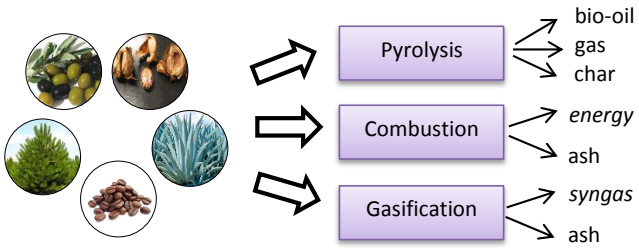


**Figure 1**. Thermochemical processes of biomass

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## P24

## KINETICS OF THE DEPLETION OF $CH_3CH_2OH$ BY REACTION WITH OH RADICALS AT TEMPERATURES OF INTERSTELLAR DENSE MOLECULAR CLOUDS (22-107 K)

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OH Radical, Ultra-low Temperature Kinetics, Interstellar Medium (ISM)

Up to now, more than 180 chemical species (molecules, ions and radicals) have been detected in the interstellar medium (ISM). In order to interpret the observed abundances, gas-phase astrochemical models include the rate coefficients (*k*) for the potential formation and depletion processes of each species. However, for most gas-phase reactions, *k* is not known at the temperatures of the dense molecular clouds in the ISM (10-100 K). Usually *k* values used in modelling the abundances are estimates or extrapolations from temperature dependences reported at T > 200 K. Particularly, the last method is not valid for many radical-molecule reactions due to the observed enhancement of k at low temperatures [1].

Ethanol ($CH_3CH_2OH$) was first detected in SgrB2 by Zuckermann et al in 1975 [2] and the purpose of this work is to determine *k* for the gas phase reactions of OH radicals with $CH_3CH_2OH$ at very low temperatures (22-107K), using the CRESU (Cinétique de Réaction en Ecoulement Supersonique Uniforme or Reaction Kinetics in a Uniform Supersonic Flow) technique. This technique has been described in detail by Jiménez et al [3]. It is based on the isentropic gas expansion through a Laval nozzle from a high pressure region to a low pressure region to cool down the gas to get uniform jets in temperature and total gas density over several tens of cm. The impact of the measured rate coefficients will be discussed in terms of their impact on astrochemical models.

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**P25**

# PHYSICOCHEMICAL CHARACTERIZATION AND YIELD ASPECTS IN NEW TABLE GRAPE CULTIVARS IN SUBTROPICAL AREAS

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Food Science and Technology

The traditional table grape cultivars, when cultivated in subtropical areas can be to present some adaptation problems that affect the plants growth and the bunches quality. In Brazil, the EMBRAPA Grape and Wine carry out a grape breeding program since 90s and new grape cultivars were released in the last years to against some of these problems. However, there are a demand in studies to evaluated these new cultivars in subtropical areas where it is possible to obtain two crops a year (regular and out season crops). Among the cultivars recently released by EMBRAPA Grape and Wine, highlights 'BRS Vitoria', a seedless table grape (*Vitis* spp.), recommended for cultivation in tropical and subtropical areas, with excellent horticultural performance, high bud fecundity and tolerance to downy mildew, the most important disease which affects grapevines in humid subtropical areas; presents high yield, and it is an excellent option for overseas market. Due to high yield and the production of two crops a year, bunches quality can be affected and occurs, i.e. a decrease in soluble solid contents when the source/drain relation was lower. In this context, the aim of this study was evaluated the bunches physicochemical characteristics in 'BRS Vitoria' table grapes under the production system of two crops a year. The trial was conducted in commercial field of 'BRS Vitoria' seedless table grape at Marialva, state of Paraná (South Brazil), vines were trained using an overhead trellises system and spaced at a distance of 2.5 x 5.0 m apart. The treatments consisted in kept bunches density around to four, five and six bunches per $m^2$. At the harvest was assessed soluble solids contents (SS), titratable acidity (TA), SS/TA ratio, bunches mass, production per plant (kg) and yield (ton $ha^{-1}$) The results showed that there was no significant difference between treatments for the physicochemical variables evaluated, so it is not necessary to reduce the number of bunches per $m^2$. In out season crop was recorded a yield around to 15 ton $ha^{-1}$ and 25 ton $ha^{-1}$ in the regular crop.

## P26

# JOINING TOGETHER GRAPHENE AND FULLERENE

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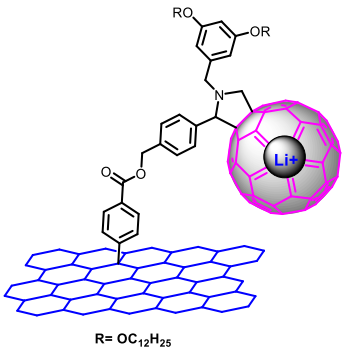
Organic Chemistry

Since the discover of graphene in 2004, this material has attracted massive attention due to their unique properties, like mechanical resistance and good stability under chemical and thermal treatments, and emerging as a new interesting field for a great number of technological applications.[1] On the other hand, fullerene $C_{60}$ is other carbon nanostructure, which have been studied along the last two decades, maintaining great attention owing its remarkable reactivity and optical properties.

Recently, hybrids combining different carbon nanostructures such as carbon nanotubes (CNTs),[2] graphene oxide (GO)[3] and carbon nanohorns with $C_{60}$ *via* either *covalent* or *noncovalent* functionalization have been developed, driven by the possibility of combine the outstanding properties in a single material.

In this communication, we present our results on the synthesis and study of the properties of new nanohybrids involving graphene and fullerene $C_{60}$ or endohedral-metallofullerene Li@$C_{60}$.

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**P27**

# MODIFIED MAGNETIC NANOPARTICLES IN THE TARGET ANALYSIS OF SOME EMERGING POLLUTANTS

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The increasing use of pharmaceutical products has turned into an environmental problem. Analgesic and nonsteroidal anti-inflammatory drugs (NSAIDs) are the most widely prescribed drugs, so their discharge from pharmaceutical factories, hospitals and private household effluents produces a big burden on the environment, especially in water resources. Their concentration in natural waters is typically from $ngL^{-1}$ to $\mu gL^{-1}$, so sample preparation techniques that provide adequate sensitivity and selectivity are needed prior to instrumental analysis.

The use of magnetic materials in solid phase extraction has received considerable attention in recent years, taking into account many advantages arising from the inherent characteristics of magnetic particles. Magnetic solid phase extraction (MSPE) methodology overcomes problems such as column packing and phase separation, which can be easily performed by applying an external magnetic field.

In this work, magnetic cellulose nanoparticles (MCNPs) coated with 1-butyl-3-methylimidazolium hexafluoro phosphate ionic liquid (IL) are proposed for the first time as sorbents for MSPE method for the determination of paracetamol, ibuprofen, naproxen and diclofenac in natural waters. This approach can be considered as environmentally friendly because the MCNPs-IL material is made up of cellulose, a renewable material, the IL is not toxic and only a little volume of organic solvent as dispersive agent is required. HPLC with ultra violet (UV) and fluorescence (FD) detector was used after the sample preparation.

The optimized MCNPs-IL-HPLC method showed limits of detection in the range 0.11–0.25 $\mu g\ L^{-1}$ with excellent linearity ($R \geq 0.9985$), relative standard deviation below 5%, enrichment factors from 29 to 34 and recoveries close to 100 %.

**P28**

# AGGLOMERATION OF NANOPARTICLES FOR IMPROVED PROCESS SAFETY USING SPRAY-DRYING

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Laboratorio de Tecnología de Polímeros

Nanosized particles are of great scientific interest due to their small size and high surface area, what provide them with unique physical and chemical properties. However, the exposure to these materials supposes potential safety and health hazards. The scaling-up of the production process of nanoparticles requires the use of suitable technologies for its safe handling and transportation.

The main way of entrance of nanomaterials into the organism is by inhalation. The deposition of the particles in the respiratory system highly depends of the particle size. Thus, the goal of this work is the increase of the particle size of the product through agglomeration by using the spray drying technology, obtaining non-respirable micron-sized granules [1].

The nanoparticles are synthesized by means of the sol-gel process, using an alkoxide as precursor [2]. As a result, a liquid suspension of nanoparticles is obtained, that is then dried by means of a spray-dryer. The suspension is sprayed in small drops into a drying chamber where a hot nitrogen stream dries the solvent, which is further recovered. The particles, in the form of agglomerated dry dust are recovered by means of a high efficiency cyclone [3].

The process of agglomeration of nanoparticles is developed in two different scales. First, the optimisation of the operation conditions at laboratory scale was carried out. After that, the process has been scaled-up to pilot plant scale.

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**P29**

# BENEFITS OF CARBON NANOTUBE BASED MAGNETIC SOLID PHASE EXTRACTION IN THE SELECTIVITY OF SAMPLE PREPARATION FOR POLLUTANTS

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A key step in analytical process is sample preparation. A number of techniques have been used for this purpose in relation to analytes that are typically found at trace levels in complex samples. Novel methodologies based on the use of new nanomaterials have been developed and an interesting option is the combination of magnetic nanoparticles coated with carbon nanotubes (CNTs) for magnetic solid-phase extraction (MSPE). MSPE provides a fast and easy separation of analytes using an external magnet and avoids the time-consuming traditional on-column SPE procedures and CNTs provides selectivity. The potential of this combination has been explored for the analysis of different pollutants in several water samples.

Firstly, a rapid and reliable method based on MSPE and ultra-high performance liquid chromatography (UHPLC) analysis was developed and validated for the quantitative determination of seven polycyclic aromatic hydrocarbons (PAHs) in water samples. Magnetic nanoparticles (MNPs) coated with multi walled carbon nanotubes (MWCNTs) were tested as adsorbent materials. Parameters that affect the extraction efficiency were carefully investigated. The instrumental LODs and LOQs achieved were in the range of 0.025–0.73 and 0.04–2.4 ng $mL^{-1}$ respectively. The recoveries of PAHs were from 76.4 up to 106.5 %. To evaluate the performance, the method was applied to synthetic and real water samples.

Secondly, mercury speciation analysis was carried out in water samples. Not only is this analysis challenging because mercury is present at ultra-trace levels, but also because the most toxic and important mercury species (monomethylmercury, MMHg) is around 5% of the total concentration. In this work, the speciation analyses were carried out by gas chromatography coupled to atomic fluorescence detection (GC-pyro-AFS) after derivatization by ethylation. We studied the performance of MNPs coated with different types of CNTs. After a careful optimization, the developed method allowed the selective determination of MMHg and the clean-up of other mercury species. The LOD and LOQ achieved for MMHg were 5.4 and 17.9 pg $L^{-1}$, respectively. The methodology was validated analyzing several spiked real water samples with recoveries close to 100%.

Acknowledgment: Spanish Ministry of Economy and Competitiveness CTQ2016-78793-P) and Junta de Comunidades de Castilla-La Mancha (PEIC-2014-001-P).

**P30**

## BIOPROSPECTING OF AGROINDUSTRIAL RESIDUES FROM SOLID STATE FERMENTATION WITH SUBSEQUENT PRODUCTION AND ENZYMATIC PURIFICATION

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Food Science and Technology

Due to the expansion of the industrial applications of lignocellulosic enzymes, the interest in the production of these enzymes by microorganisms through processes that promote high yields at low cost is increasing. Lignocellulosic raw materials are the most abundant renewable sources found in nature, so they are mostly comprised of agroindustrial, urban waste and wood from angiosperms and gymnosperms. The three main polymeric fractions that make up the lignocellulosic biomass are lignin, hemicellulose and cellulose, which are linked together by covalent and non-covalent bonds, forming a complex network resistant to microbial attacks. The biodegradation of cellulose is made by a complex of oxidative and hydrolytic enzymes that act synergistically in the transformation of the molecule into monomers and glucose dimers. This complex is formed by endoglucanases, exoglucanases and β-glycosidase, classified according to their place of action on the cellulosic substrate: a) Endoglucanases, which cleave internal bonds of the cellulosic fiber; b) Exoglucanases, which act in the external region of the cellulose; and c) β-glycosidases, which hydrolyze glucose-soluble oligosaccharides. Among the microbial biodiversity existing on the planet, filamentous fungi present a wide capacity of adaptation in the most varied solid substrates. Due to this characteristic, the industrial production of enzymes can be performed from solid-state fermentation processes using agroindustrial residues and by-products as a substrate for the growth of these fungi, which stand out as producers of enzymes of degradation of lignocellulose. The adaptation of a given microorganism to thermophilicity involves the adjustment of the cytoplasmic membrane, proteins and DNA to temperatures above the mesophilic range. This thermophilic molding has aroused great interest in biotechnology, considering that thermoresistance mechanisms of the biomolecules of these microorganisms may be interesting models for bioengineering and bioprocesses. Thus, knowing and purifying the thermostable enzymes of these microorganisms would bring advances and boost new research. Thus, separation and purification techniques such as electrophoresis and high performance liquid chromatography using LCMS / MS mass spectrometer coupled detectors were employed in order to obtain these proteins from a pure was for their subsequent application in several sectors.

**P31**

## HYPERTERMIA-INDUCED SEIZURES AFFECTS THE BEHAVIOR IN RATS.

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Ciencias de la Salud

Febrile seizures (FS) is one of the most common convulsive disorders in infants and young children that only occurs in children between 3 months and 6 years-old, when the cerebellum is still developing.

In the present work, we have analyzed the consequences of febrile seizures on motor coordination and gait from adolescent and adult rats using balance beam and footprint test. In balance beam test motor coordination and balance were analyzed by measuring the ability of the rat to traverse a graded series of narrow beams to reach an enclosed safety platform in balance beam test. On the other hand, footprint test was used to compare the gait in different rats. The hind- and forefeet of the rats were inked with orange and pink nontoxic paints, respectively, and the rats were allowed to walk along a 50-cm-long, 10-cm-wide runway (with 10-cm-high walls). The footprint patterns were analysed in terms of the following parameters: a) stride length that represent the average distance of forward movement between each stride; b) Hindpaw and forepaw base that correspond to the average distance between left and right hind footprints and left and right front footprints and c) forepaw/hindpaw overlap, the distance between forepaw and hindpaw print, was used to measure uniformity of step alternation.

Results obtained have shown that in adolescent rats the time required to cross the 18 mm-round section and 12 mm-round section beam were significantly higher in hyperthermic group than in control animals. Similar results were obtained in adult rats when 35 mm-square section was used. Concerning footprint test, forepaw/hindpaw overlap resulted significantly higher in adolescent rat whereas stride lenght, forepaw and hindpaw base were altered in adult rats exposed to HIS.

We conclude that hyperthermia-induced seizures evoked fine motor coordination impairment and gait disturbances in both adolescent and adult rats.

**P32**

# BIFUNCTIONAL ALUMINIUM(HETEROSCORPIONATE) CATALYSTS FOR THE FORMATION OF CYCLIC CARBONATES FROM EPOXIDES AND CARBON DIOXIDE

F. De la Cruz-Martínez*, A. Lara-Sánchez, A. Otero, J. A. Castro-Osma, J. Martínez, J. Fernández-Baeza

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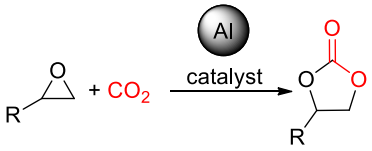
Área de Química Inorgánica

The use of carbon dioxide ($CO_2$) as a universal renewable resource is a challenge for chemists. It requires efficient strategies for the conversion of $CO_2$ into economically competitive products to help to stabilize and reduce atmospheric carbon dioxide levels to mitigate the greenhouse effect and to develop an alternative and sustainable raw material.[1] One of the most promising reactions in this field is the synthesis of cyclic carbonates from epoxides and $CO_2$ (Scheme 1). Even though this reaction is highly exothermic due to the release of the epoxide strain energy, it requires a suitable catalyst to lower the high activation barrier. Among these catalysts, bifunctional systems or one-component catalysts, have been less developed probably owing to their more synthetically demanding preparation.[2]

Inspired by the high catalytic activity displayed by the aluminium complexes,[3] this work reports the design of new iodide heteroscorpionate precursors that makes the synthesis of mono- and bimetallic bifunctional aluminium complexes and their application as catalysts for the conversion of epoxides into their corresponding cyclic carbonates.




Scheme 1

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# CÓMO FUE LA EDICIÓN DEL AÑO PASADO…

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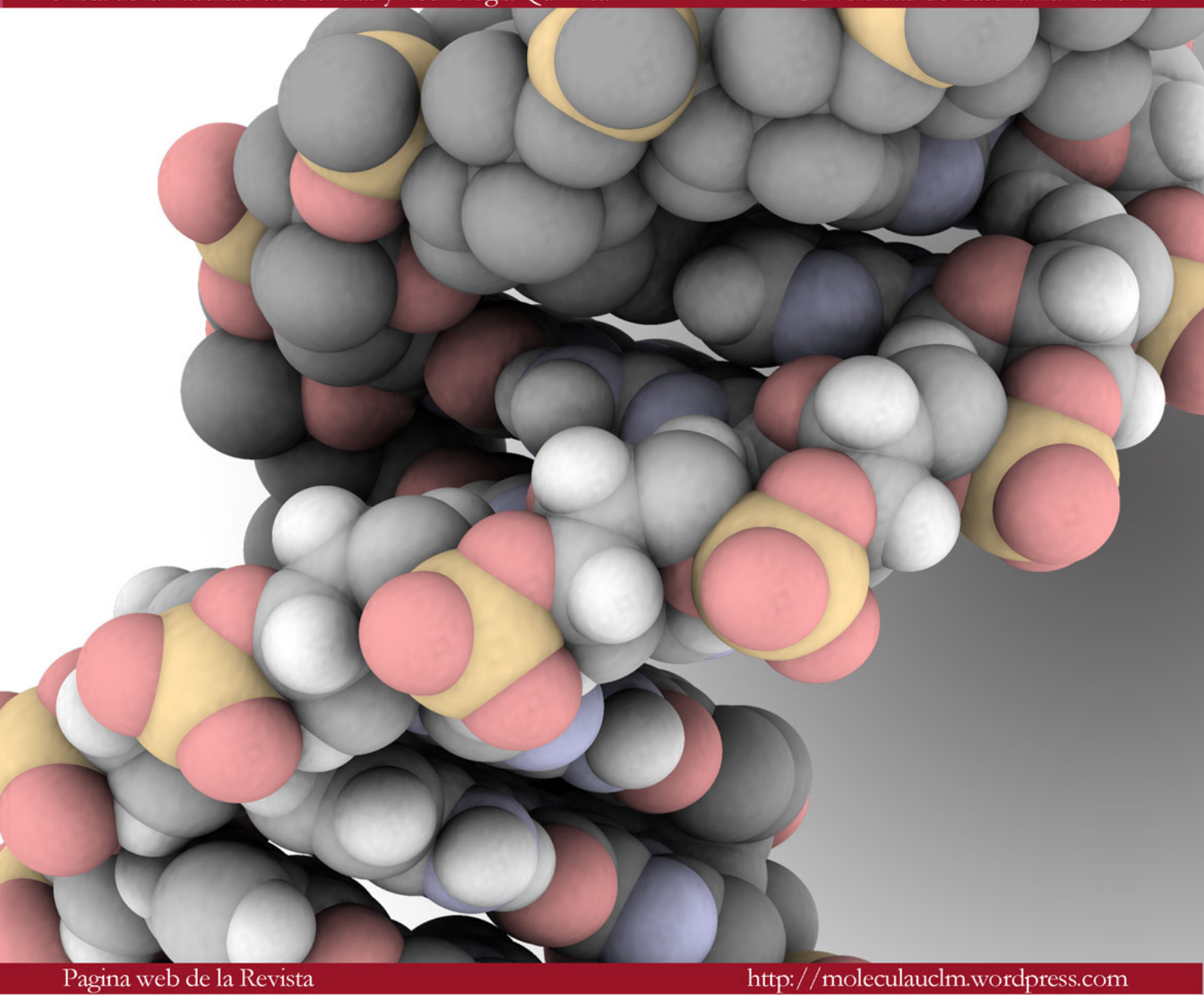

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# PRESENTACIÓN

El número de Junio es un número monográfico dedicado a las jornadas de Ciencia Joven. Este año se ha producido un aumento del número de contribuciones y hay una serie de conferencias de gran interés.

Desde este número la revista tiene ISSN, lo que nos permitirá ampliar la capacidad de publicación. Por ejemplo los resúmenes de Ciencia Joven publicados en este número ya seconsidera que están publicados en una revista oficial.

Todos esperamos que esto anime a los investigadores a mandarnos cualquier información que consideréis de interés.

El consejo editorial.

CIENCIA JOVEN

# PRESENTACIÓN

# CIENCIA JOVEN

**La Facultad de Ciencias y Tecnologías Químicas de la Universidad de Castilla-La Mancha (UCLM) en Ciudad Real ha acogido iernes el simposio Ciencia Joven, durante el que los investigadores noveles presentan sus líneas de trabajo a sus colegas del centro universitario. El encuentro, que cumple su décima edición con un programa ampliado, ha sido inaugurado por el rector de la UCLM, Miguel Ángel Collado, a quien ha acompañado el consejero de Educación, Ángel Felpeto.**

Los jóvenes investigadores de la Facultad de Ciencias y Tecnologías Químicas han trabajado intensamente en el desarrollo del décimo Simposio de Ciencia Joven, una iniciativa organizada por ellos mismos que les sirve como plataforma de presentación de sus líneas de investigación y de sus avances. El encuentro ha sido inaugurado formalmente esta mañana por el rector de la Universidad de Castilla-La Mancha (UCLM), Miguel Ángel Collado, quien ha puesto el acento precisamente en el carácter intergeneracional del simposio. “Gran parte del éxito de esta iniciativa se encuentra en el hecho de que propicia la participación de investigadores jóvenes y de otros con una amplia experiencia”, ha explicado el rector, quien también ha elogiado la actividad investigadora y la importante capacidad de transferencia de resultados de la Facultad de Ciencias y Tecnologías Químicas.

Por su parte, el consejero de Educación, Ángel Felpeto, ha manifestado una “total implicación con la Universidad de Castilla-La Mancha” que proviene de su experiencia como director de la extinta Escuela Universitaria de Ingeniería Técnica de Toledo y de la más reciente, como miembro del Consejo Social de la UCLM, en la que cesó tras su nombramiento al frente de la Consejería. “Yo siento a la Universidad de Castilla-La Mancha como mía, y me gustaría que así la sintieran todos los ciudadanos castellano-manchegos, las empresas; que sintiéramos que nuestra universidad marca el futuro de nuestra región”, ha expresado.

**Los jóvenes, protagonistas**

El decano de la Facultad de Ciencias y Tecnologías Químicas, Ángel Ríos, se ha referido a la celebración del simposio Ciencia Joven como una excelente oportunidad para los investigadores noveles. “Nuestra intención –ha señalado- era que los jóvenes investigadores fueran los protagonistas de este simposio, así que todo lo hacen ellos, desde la organización del evento a la recepción y selección de comunicaciones, y, lo que es más importante, la presentación de su propio trabajo, sus líneas y sus resultados”.

En el simposio, en el que colabora la Real Sociedad Española de Química, se han inscrito un total de 140 investigadores y se han admitido treinta y seis comunicaciones orales en los distintos ámbitos que abarca la Facultad: Química Inorgánica, Ingeniería Química, Química Orgánica y Química Analítica.

# CIENCIA JOVEN

Entre otras líneas de investigación, durante estos días se está hablando de las propiedades de los aceites vírgenes del pistacho, del tratamiento de los residuos de agua en la industria farmacéutica, de nuevos tratamientos terapéuticos en la lucha contra el cáncer, o de nuevas tecnologías de producción de hidrógeno.

El simposio se completa con la intervención de los prestigiosos investigadores externos José Luis Sotelo y Abderrahmane Boujakhrout, de la Complutense de Madrid; Rachid Salghi, de la universidad marroquí de Ibn Zohr; y José Cernicharo y Raquel Mateos Briz, del Consejo Superior de Investigaciones Científicas.

Gabinete Comunicación UCLM. Ciudad Real, 9 de junio de 2016

CONFERENCIA INVITADA

# ELIMINACIÓN DE CONTAMINANTES PRIORITARIOS Y EMERGENTES PRESENTES EN AGUAS

José Luis Sotelo

Existe un interés creciente sobre la presencia de contaminantes específicos en concentraciones reducidas en aguas potables y residuales, con miras a incrementar la calidad de las aguas y facilitar su reutilización. La disponibilidad de técnicas analíticas muy sensibles y el desarrollo de métodos terciarios de tratamiento han facilitado su estudio. Estos contaminantes proceden de fuentes diversas, tales como la actividad industrial o agrícola, o la propia actividad humana. Un primer enfoque se centró en los contaminantes procedentes de la actividad industrial, que aunque se encuentran en concentraciones reducidas tienen en muchos casos fuerte impacto y toxicidad. Así existen leyes que prohíben completamente la incorporación de estos contaminantes a las redes de tratamiento o limitan su vertido. Se han definido asimismo un conjunto de contaminantes prioritarios, presentes en aguas en concentraciones muy bajas pero de elevada toxicidad y persistencia, y dentro de ellos se destaca un grupo por su mayor peligrosidad al ser bioacumulables, existiendo disposiciones que fijan las concentraciones máximas permisibles en aguas continentales y normas para limitar sus vertidos. Por último, se define un grupo de contaminantes emergentes, derivados en su mayor parte de la actividad humana, y presentes en aguas en concentraciones muy bajas, sobre los que no existen todavía normativas, aunque reciben atención creciente y sobre los que se realiza una intensa investigación. Además de los tratamientos biológicos habituales en las plantas de tratamiento, que pueden destruir total o parcialmente algunos de estos contaminantes, el carácter refractario de muchos de ellos, obliga a utilizar tratamientos terciarios adicionales para lograr una destrucción más extensa. Se han desarrollado numerosos tratamientos terciarios que permiten la destrucción en mayor o menor extensión de estos contaminantes. Cada una de estas tecnologías, algunas maduras y ya establecidas y otras todavía en desarrollo, se han aplicado a muy diferentes contaminantes, en condiciones variables, más o menos cercanas a la realidad (nivel de concentración, compuestos puros o mezclas reales). Finalmente, debe contemplarse el objetivo último para la aplicación de estas técnicas. Como ejemplo, se considera la reutilización de aguas residuales, que impone unos niveles de calidad más elevados que los correspondientes al simple vertido de las aguas tratadas a los cauces públicos.

CONFERENCIA INVITADA

# PHYTOBAC AND ELECTROCOAGULATION: TWO PRACTICAL MANEGEMENT TOOLS FOR PESTICIDES WASTEWATERS

Rachid Salghi


The disposal of pesticide-containing waste is a problem of worldwide concern. With almost every stage of pesticide used involving the formation of wastes [1], that contains substances that are strictly controlled by regulatory bodies. The presence of large stocks of pesticides that are unusable, either due to the fact that they are banned or have expired, is of great concern especially, in developing countries [2]. Various methods for pesticide treatment are available, according to the World Health Organisation which include high temperature incineration, chemical treatment or removal to specially engineered landfill sites [2].

This work provides new results on the electrocoagulation and phytobac degradation of pesticide and lead to the following conclusion such as, after 1 year, the pesticide residue in the pytobac is lower at limit of quantification (LOQ). For all pesticide studied by electrocoagulation the removal of pesticide wastewater is between 95 to 98 %.

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CONFERENCIA INVITADA

# NANOMATERIALES HÍBRIDOS PARA BIOSENSORES

Abderrahmane Boujakhrout


Durante los últimos años, el desarrollo de biosensores electroquímicos con mejores propiedades analíticas y de estabilidad ha estado estrechamente relacionado con el diseño de nanomateriales de nueva generación. Dentro de este campo, la preparación de nanomateriales híbridos ha recibido especial atención, dado que las propiedades bioelectroanalíticas de estos nanomateriales pueden ser racionalmente predeterminadas a partir de la manipulación de los diferentes materiales constituyentes. En esta presentación se describen diversas metodologías orientadas a la preparación de nuevos nanomateriales híbridos para su empleo en el diseño de biosensores electroquímicos. Estas estrategias incluyen:

- La preparación de derivados de óxido de grafeno reducido modificado con derivados de polísacáridos hidrosolubles.
- La síntesis de nanohíbridos de grafeno decorado con nanopartículas de oro y brochas de dextrana monofuncionalizada.
- La preparación de materiales hibridos de grafeno y dendrímeros de poliamidoamina.
- El diseño de nanopartículas Janus de oro-sílica mesoporosa para su uso como soporte para la co-inmobilización de enzimas y su empleo en la construcción de biosensores bienzimáticos.
- La síntesis de nanocintas de polímeros de coordinación de plata-bipiridina decoradas con nanopartículas de oro, con actividad intrínseca tipo peroxidasa.

Asimismo, se describe el diseño de un inmunosensor electroquímico, desarrollado en colaboración con la UCLM, para la determinación de Brettanomyces bruxellensis en vinos tintos.

CONFERENCIA INVITADA

# CAFÉ Y CHOCOLATE: DE ALIMENTOS PROHIBIDOS A ALIMENTOS PARA LA PREVENCIÓN DE ENFERMEDADES

Raquel Mateos Briz


El café y el chocolate en forma de productos solubles de cacao, dos de las bebidas más consumidas en nuestra sociedad, son alimentos controvertidos. Sin embargo, estudios de intervención con humanos recientes revelan que su consumo moderado tiene un efecto beneficioso para la salud cardiovascular asociado a su composición rica en fitoquímicos. En el caso del cacao principalmente a través del incremento de la concentración de HDL-colesterol, y en el del café por sus efectos hipotensivos, hipolipémicos, hipoglucémicos y antioxidantes, fundamentalmente, observándose además una acción positiva sobre la composición corporal. Estos resultados indican que el consumo de estos alimentos es recomendable para la población en general, mostrando el café mezcla tostado/verde beneficios adicionales que permiten su recomendación a personas con sobrepeso o en las primeras fases de la diabetes tipo 2.

CONFERENCIA INVITADA

# ASTROQUÍMICA: COMPLEJIDAD QUÍMICA EN EL ESPACIO

José Cernicharo


La astroquímica es un campo de investigación bastante reciente de la Astrofísica. En los años 70 se detectaron varias especies moleculares en las nubes de gas y polvo del medio interestelar abriendo así la puerta al estudio de las condiciones físico-químicas de las zonas de formación de estrellas y planetas.

Las moléculas se forman a partir de reacciones bimoleculares iniciadas por los rayos cósmicos en los que la molécula H3+ juega un rol esencial. A lo largo de la evolución dinámica de dichas nubes las reacciones de superficie en los hielos que cubren los granos de polvo participan en el aumento de la complejidad molecular en el espacio. Se han detectado unas 180 especies moleculares a través de su espectro rotacional y toda una familia de moléculas todavía mal caracterizadas, pero ubicuas, compuestas por múltiples anillos bencénicos, los llamados PAHs (hidrocarburos policíclicos arómaticos).

En el momento de formación de los discos proto-planetarios la composición del gas y de los granos de polvo van a jugar un papel clave en la formación de planetas, en particular de planetas rocosos como la Tierra.

Se analizarán los procesos químicos que dan lugar a las especies moleculares encontradas en el espacio y se discutirán los procesos de formación de los granos de polvo.

Finalmente se presentará el proyecto Nanocosmos que pretende reproducir en el laboratorio los procesos químicos que dan lugar a la formación de las nanopartículas a partir de las cuales se forman los granos de polvo en las atmósferas de las estrellas gigantes rojas.

# COMPOSITION AND PROPERTIES OF PISACHIO VIRGIN OILS AND ITS BY-PRODUCTS FROM DIFFERENT CULTIVARS

R.M. Ojeda-Amador, S. Gómez Alonso, M.D. Salvador, G. Fregapane

Food Science and Technology

Since several years, particular attention has been given to the dietary consumption of nuts (almonds, pistachios, walnuts and so on) due to their higher content in unsaturated fatty acid, antioxidants and biological active compounds, and thus their possible beneficial health effects. Among nuts, pistachio (Pistacia vera) exhibits interesting nutritional value, mainly due to the content of phenolic and tocopherol compounds, which show antioxidant and other bioactive properties. The aim of this work is the characterization of four different pistachio cultivars (Avdat, Larnaka, Kerman and Mateur), their cold-pressed virgin oils and residual cakes. The chemical analyses were carried out to assess the total and individual phenolic content (by Folin-Ciocalteu and LC-MS), tocopherols (by HPLC) and their antioxidant activity (by DPPH and ORAC). Fatty acids and volatile compounds were measured also in these oils. Furthermore, the sensory properties of pistachio virgin oils have been evaluated, which provide greater value to consumers than refined oils. The present work is a first step to describe the chemical composition of different pistachio varieties. Future work may investigate the effect of roasting and of different operating conditions during cold-press extraction on pistachio virgin oil components.

# CHIRAL N,N,CP-SCORPIONATE ZINC ALKYLS AS EFFECTIVE AND STEREOSELECTIVE INITIATORS FOR THE LIVING ROP OF LACTIDES

A. Otero, J. Fernández-Baeza, L.F. Sánchez-Barba, J.Tejeda, M. Honrado, S. Sobrino, A. Garcés, A. Lara-Sánchez, A.M. Rodríguez
Inorganic Chemistry


During the last years, our research group has contributed widely in the preparation of efficient catalysts bearing heteroscorpionate ligands derived form bis(pyrazol-1-yl)methane moieties for the preparation of biodegradable polymers by a well-controlled ring-opening polymerization (ROP) of cyclic esters,[1] such as lactide, an inexpensive annually renewable natural feedstock.[2] The biocompatible nature of the polylactides[2] (PLAs) have attracted our attention in the employment of biocompatible metals such Magnesium or Zinc for the design of these catalysts. In this context, whereas a large number of complexes containing [NNX] (X= N, O, S) heteroscorpionate ligands have been prepared,[1] the [NNCp] hybrid scorpionate/cyclopentadienyl compounds have been, contrarily, little studied.[1,3]

In the present work, we described the synthetic accessibility of the first examples of Zinc metal complexes bearing a racemic hybrid scorpionate/cyclopentadienyl ligand, their different structural arrangements, the reactivity found, as well as their catalytic behavior as single-component initiators for the efficient and stereoselective ROP of rac-lactide in the production of heterotactic-and isotactic enriched polylactides.

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# WASTEWATER MANAGEMENT IN THE PHARMACEUTICAL INDUSTRY

J.F. Pérez, C. Sáez, J. Llanos, C. López, P. Cañizares, M.A. Rodrigo

Chemical Engineering


The primary objective of the pharmaceutical industry is to produce substances that have therapeutic value for humans and animals. Those industries make use of a vast array of complex batch-type processes and technologies in the manufacture of pharmaceutical products. With this diversity of processes comes a similarly diverse set of waste streams, including aqueous effluents. In particular, wastewater generated in organic-synthesis pharmaceutical plants are complex and highly toxic, mainly containing: organics (remaining reagents, reaction products and by-products, solvents) and ionic compounds (reagents, acids/bases) resulting in both high COD and salinity levels. Due to the diversity of characteristics of those effluents, there is not a single technology which meets all the requirements from every industrial facility. Because of this, wastewater treatment from pharmaceutical facilities requires an intensive research in order to develop the most appropriate processing sequence. In this context, a close collaboration with a pharmaceutical company from Castilla-La Mancha is in progress. First part of the project consisted in sampling and analyzing every waste stream generated in the facility (approximately 160 samples). Next, a technological screening was conducted for testing a wide range of technologies for the treatment of the aforementioned wastewater. With all this information, an optimal management strategy was developed. At the same time, some of the electrochemical alternative of the technologies applied during the screening are under study. In particular, a novel and cost-effective electro-fenton reactor is currently being developed. Preliminary tests indicate that this design could mean a great leap in the development of the electro-fenton technology.

# THE METABOLIC RESPONSE TO INGESTION OF A BOLUS OF FAT IS CONDITIONED BY THE AGE

A. Fernández, N. Gallardo, A. Andrés

Biochemistry

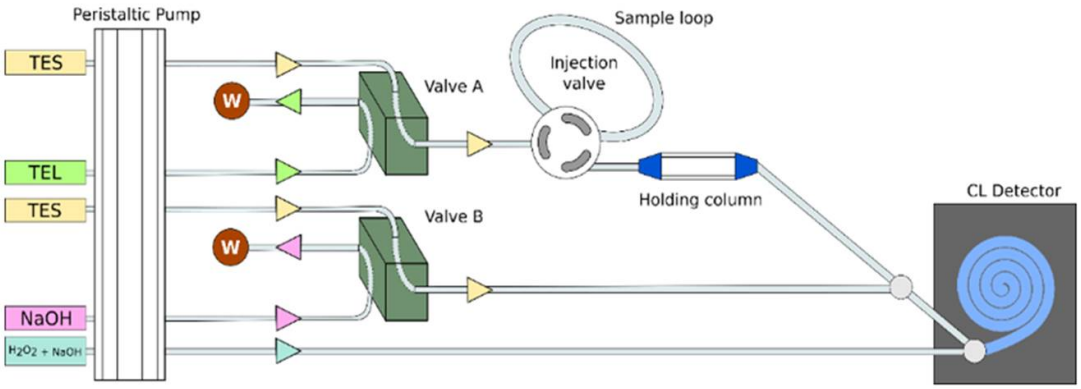

Excess of ingested fat may be converted in glucose, but this process will take hours. However, fat intake itself have a considerable impact on postprandial glycemia for two reasons: 1.- Fats meal delayed gastric emptying, thereby delaying the digestion and absorption of carbohydrates, and consequently the increase in blood glucose after food intake. 2.- Fats impairs insulin sensitivity, and this condition is maintained for hours. Decreased insulin sensitivity lead to increased hepatic glucose production and / or decreased insulin-mediated glucose uptake. However, insulin-independent mechanisms for glucose lowering also account for glucose disposal. Thereby, increasing our current knowledge on the role of fat meal on postprandial glycemia will be of great relevance for diabetics in order to adjust the proper dose of hormone during insulin therapy. Increasing age is a major risk factor for the development of type 2 diabetes, thus, we hypothesize that ageing is associated to changes in lipid metabolism in the postprandial state that cause postprandial hyperglycemia. To this end we performed an oral fat tolerance test. The experiment was conducted in 3-, 8- and 24-months-old Wistar rats. Overnight fasted rats were administered a bolus of virgin olive oil intragastrically (1 mL/Kg of body weight) and blood samples were taken from the tail vein before the fat load (t = 0) and 30, 60, 90, 120, 180 and 240 min after fat administration. Blood glucose, triacylglycerides and total cholesterol were determined immediately using an Accutrend Glucose Analyser (Roche). Blood samples were centrifuged and plasma was frozen at −70 ° C until FFA, ketone bodies, insulin, leptin and FGF21 estimation. Overall changes in lipids, glucose and insulin during the test were calculated as the area under the curve above the basal level. In addition we measured the expression of several genes involved in lipid and glucose metabolism in both liver and adipose tissue. We found Age-Related Differences in postprandial metabolic profile and liver and adipose tissue response to fat intake. Aged rats need more insulin to maintain postprandial normoglycemia, nevertheless, hyperglycemia occurs at 240 min after fat administration. We suggested that the impairs in glucose homeostasis observed in aged rats after a fat meal occurs via insulin-dependent and insulin-independent mechanisms.

# DETERMINATION OF BIOMOLECULES BY CHEMILUMININESCENCE IMMUNOASSAY (CLIA)

J.A. Murillo, A. Alañón, E. Jiménez

Analytical Chemistry


Mycotoxins are toxic compounds produced as secondary metabolites by fungi. These toxins are highly hepatotoxic, nephrotoxic, teratogenic and mutagenic to most mammalian species. They have also shown carcinogenic effects in humans. On the other hand, the impact of the food allergies in the society has presented important challenges for both, the clinical allergology and the food industry. That reason, the information of the presence of allergens should be considered as mandatory in the labelling of foods and it is of great importance to develop fast, low cost analytical methods with high selectivity and sensitivity. In this study, in addition to the determination of mycotoxins, it is proposed the analysis of various allergens (water-soluble proteins or glycoproteins), since in recent years consumers are demanding more information about the foods we eat. It is intended to use a specific recognition element, locking systems such as gels and new materials including modified and magnetic nanoparticles and nanotubes. For this purpose, a new assembly has been designed consisting of simple and economical immunoassay techniques adapted to a flow injection system and chemiluminescence detection. The initial scheme designed for the method is shown below. As an initial task in a new line of work we have tried to understand and manage the steps involved in the immunoassay, such as the anchor of the antibody on the support, the labeling of the chemiluminescent molecule with the antigen and the quantum efficiency of such molecule. The resulting methodologies will be validated by comparison with official methods or those described in the scientific literature to demonstrate the advantages of the developed procedures and the new instrumentation.



# SMART SELF-HEALING HYDROGELS BASED ON GRAPHENE

C. Martín, S. Martín, M. Prato, E. Vázquez

Organic Chemistry


Inspired by nature, self-healing materials[1,2] represent one of the vanguards of recent developments in the synthesis of new smart materials. All natural or synthetic materials accumulate damage at macro or microscale, losing even the function of the device due to the deterioration or disappearance of their desirable properties. However, self-healing materials can reverse or repair the damage zone once or several times because they are able to recover their capabilities. This fact enhances the lifetime of these kinds of materials. There is a multitude of strategies used to synthesize self-healing gels. Overall, the chain diffusion at the interface of the damaged region was considered to be the primary driving force for repairs. Therefore, semi-interpenetrating polymer networks (semi-IPNs) are one of the best candidate materials to reach that goal. Here, autonomous self-healing capacity has been achieved in different novel composite hydrogels. The materials are synthesised by several strategies depending on the desired structure. Thus, the healing efficiency of both copolymers and semi-IPNs based on oppositely charged polyelectrolytes is studied and compared. Moreover, graphene with almost no defects[3] is also used as filler in some cases. The healing efficiency is corroborated not only by SEM analysis of the damaged/healed region, but also by tensile experiments. All the materials have excellent self-healing ability, reaching almost the 100% of healing in some cases, in which real free chains are able to diffuse through the interface, guided by existent ionic interactions. In addition, the presence of graphene into the polymer network improves the conductivity of the final composites.

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# ANIMAL WASTE VALORIZATION THROUGH THERMOCHEMICAL PROCESSES

M. Fernandez-Lopez, J.L. Valverde, L. Sanchez-Silva

Chemical Engineering

In this century, the depletion of fossil fuel reserves has been associated to the growing energy demand which has caused, simultaneously, severe environmental problems, including air pollution, global warming and acid rain. For this reason, renewable energies offer a good alternative to solve these drawbacks since they are a never-ending resource to human scale. Among the different renewable energy sources, biomass seems to be one of the most viable routes for the production of clean energy and chemical products. Specifically, livestock biomass is generated from animal fats, carcasses and excrements, being this animal waste known as manure. The accumulation of livestock manure (LSM) has associated some hygienic and environmental problems due to its high potential for pollution and production. Moreover, traditional uses of livestock manure (LSM) as fertilizer have to be changed due to land limitations and strict regulations. Therefore, the valorization of the manure surplus for bioenergy generation could be a sustainable choice since it is considered a zero-cost feedstock. Generally, the conversion of LSM into energy could be carried out through biological or thermochemical processes. One of the most common biological processes is the anaerobic digestion (AD), resulting in the generation of biogas and a residual digested. Concerning the thermochemical conversion routes, in this work, three thermochemical processes have been proposed for the valorization of LSM: pyrolysis, combustion and gasification processes. Thermogravimetric analysis (TGA) has been widely used for the study of these thermochemical conversion processes. In the present work, the pyrolysis, combustion and gasification processes of different manure samples were investigated by means of TGA coupled with mass spectrometry analysis (MS), being the latter the only one able to afford real-time and sensitive detection of evolved gases

# NEW FERROCENYL DERIVATES AS POTENTIAL DRUGS FOR BREAST CANCER TREATMENT

B. Díaz de Greñu, M.C. Carrión, F.A. Jalón, B.R. Manzano

Inorganic Chemistry

Breast cancer causes cells in the breast tissue to change and grow in an uncontrolled way. It is the most common female cancer (less than 1% of all breast cancer cases affect men) and the second most common cancer overall, causing around 15% of female cancer deaths around the world.[1] Estrogens, the major hormone involved in the biology of breast cancer, bind to receptors in cells which cause cells to divide. Therefore tumour growth can be prevented by controlling the supply of estrogens to the breast tumour, either blocking the receptors or by inhibition of estrogens production. The former case is accomplished by drugs such as Tamoxifen, a prodrug that competes with estrogens for binding to the active site of estrogen receptors in cells. The latter case is conducted by the inhibition of the enzyme aromatase by drugs like Letrozole, thus reducing the amount of estrogens in the body. During the last decade, Jaouen et al. found that the incorporation of a ferrocene moiety to Tamoxifen resulted in improved properties when compared to the initial drug.[2] During this talk the synthesis of new Letrozole analogues containing a ferrocenyl group (generically called Ferrozoles) will be presented, which are expected to show better properties than those achieved with previous aromatase inhibitors.

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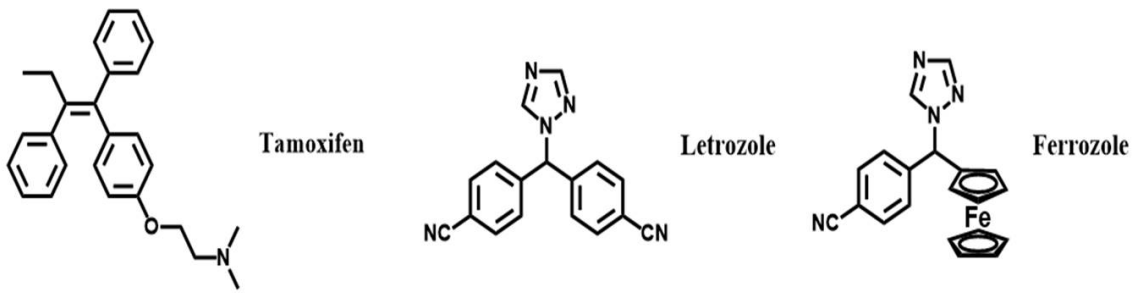

# VALORIZATION OF BY-PRODUCTS DERIVED FROM THE VINE BY ULTRASONIC-ASSITED EXTRACTION

L. Marchante, S. Gómez-Alonso, M.S. Pérez-Coello, M.C. Díaz-Maroto

Food and Science Technology


The valorization of winemaking by-products generates great interest to the food, cosmetic and pharmaceutical industries, due to their potential as a source of bioactive compounds. Nowadays, the use of winemaking by-products to obtain different functional ingredients is subject of numerous studies, where conventional extraction methods using organic solvents are used. These extraction techniques produce high pollution, so the development of alternative and clean methods, as ultrasound-assisted extraction (UAE), is required. In this sense, the aim of this work is to obtain rich-phenolic extracts from winemaking by-products by UAE, as a natural source of antioxidants. The optimum conditions for the maximum extraction of total polyphenols were estimated by means of the application of response surface methodology. The experimental design was applied only to grape marc, using ethanol-water as solvent in a solid/liquid ratio of 1:4, and performing two extraction cycles for 3 min. The best conditions to obtain rich-polyphenol extracts were 44 % of ethanol and 81 % of amplitude. Determination of the total polyphenol content was performed by the Folin-Ciocateu and the antioxidant capacity was evaluated by the method of capturing free radicals using the DPPH radical (2,2-diphenyl-1-picrylhydrazyl) and by the method of the inhibitory activity of the ABTS radical cation (2,2-azino-bis-3-ethylbenzothiazoline-6-sulfonic acid). Among the raw materials studied were included grape marc, seeds and stalks from Vitis vinifera L. Cv. Tempranillo. Also, fresh samples were compared with those drying at 45 °C, observing that the oven-drying caused a reduction of the total polyphenol content and antioxidant activity. The results show that extracts of grape marc, seeds and stalks obtained by UAE are an important source of antioxidants, and could contribute to the recovery of waste from the wine industry.

# THE ROLE OF QUANTUM DOTS FOR THE DEVELOPMENT OF ANALYTICAL METHODOLOGIES

G. Durán, A.M. Contento, A. Ríos

Analytical Chemistry


Currently, the use of nanomaterials as analytical tools is one of the most exciting trend in (bio)chemical analysis, providing new opportunities in the development of innovative approaches in the different steps of the analytical process. In this context, a clear example is the use of "quantum dots" (QDs) nanoparticles. The growing importance of this type of nanoparticles as tools in nanoscience and nanotechnology resides in their exceptional optoelectronic properties at nanoscale range due to “quantum confinement” effects and its very reactive surface. These features confer many of the interesting and, sometimes, unexpected properties of QDs.[1] Due to their exceptional optical properties, QDs have found vast applications in analytical research as the next generation fluorescent probes and new sensoring assays. Therefore, QDs are now involved in many analytical applications as analytical tools. In this way, the aim of this communication is to show several analytical procedures for the synthesis, modification and solubilization of CdSe/ZnS QDs, and their subsequent use as analytical tools, contributing to improve the detection and then the determination of compounds of interest in the several fields, such as environmental,[2] food [3, 4] and clinical.[5] Moreover, given the opportunities that they offer in the Analytical science, the development of other compositions of QDs as efficient alternative to conventional semiconductor QDs is being studied.

Acknowledgements: Financial support from MINECO (CTQ2013-48411-P) and JCCM (PEIC-2014-001-P) is gratefully acknowledged.

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# DIRECT SYNTHESIS OF HIGH QUALITY LIQUID FUELS THROUGH FISCHER-TROPSCH PROCESS

A.R. de la Osa, E. Ruíz López, J.L. Valverde, A. Lucas, P. Sánchez

Chemical Engineering

It is well known that the vast world energy demand comes from fossil fuels use. However, energy supply security concerns, air pollution, and global climate change provide incentives for introducing alternative energy carriers to petroleum products. One of the promising candidates is clean and sustainable synthetic automotive fuels produced by Fischer-Tropsch synthesis (FTS). This process has received increasing attention worldwide as can be produced from any carbonaceous feedstock, such as coal, natural gas (including stranded gas), or biomass, and also due to technical advances. Concept consists of independent, stand-alone facilities, integrated in a gasification combined cycle (IGCC) power plant, where syngas from the IGCC is routed to the FTS plant. Among the possible active phases, cobalt based catalyst provides high activity, selectivity to linear paraffins and stability toward deactivation by water. However, it is important to note that FTS catalytic performance is strongly influenced by the nature of support, metal dispersion, basicity and preparation method. In this sense, the nature of precursor has been investigated. In addition, the effect of basic promoters such as alkali-earth oxides has been studied, resulting in an important shift towards long chain hydrocarbons. Regarding catalytic support, silicon carbide, which is one of the most advanced ceramic materials, has been demonstrated to be an excellent support in such exothermic reaction due to its remarkable chemical and thermomechanical properties. However, FTS process generates a wide hydrocarbon spectra imposed by Anderson-Schulz-Flory distribution. Therefore, along with an efficient FTS catalyst, additional downstream upgrading and separation steps are required to increase selectivity toward commercial middle distillates. In an effort to improve process performance and cost-effectiveness, the possible integration of both FTS and hydrocracking in one-step through a cascade system has been tested, resulting in the direct and complete conversion to valuable fuels.

# SIGNALING PATHWAYS AFFECTED IN ALZHEIMER'S DISEASE HUMAN BRAINS

P. Alonso-Andrés, J.L. Albasanz, I. Ferrer, M. Martín

Health Science


Alzheimer's disease (AD) is the main neurodegenerative disease in aging. It is the most common dementia that affects to 24 millions of people around the world. AD is characterized by cognitive, behaviour and memory alterations. In human brain, it has been found neurofibrillary tangles with abnormal phosphorylated tau proteins, and deposits of β amyloid caused by aberrant cleavage of its precursor. Adenosine receptors are G-protein coupled receptors distributed in the Central Nervous System. They can inhibit or stimulate adenylyl cyclase activity, mediating different physiological responses in cells, and have a neuroprotective role. It is also known that protein kinase A (PKA) is implicated in learning and memory processes. Previous results of our group showed that adenosine A1 and A2A receptors are significantly increased in plasma membranes from frontal cortex brain in AD. The aim of the present work was to study different components of transduction pathway in the same cortical area. To this end, cytosolic fraction of post-mortem frontal cortex brain from different stages of AD patients and age-matched controls were extracted. PKA and PKC activities were determined by ELISA. PKC activity was significantly increased from early stages of AD (I-II of Braak). However, PKA activity revealed a biphasic profile decreasing in early-medium and increasing in advanced stages of AD. A1 and A2A receptors analysed by Western-blot were both significantly increased in early stages of AD and AC1, the main isoform coupled to these receptors, was also increased in the same stages. Moreover, βA1-40 was significantly increased from early stages while βA1-42 was increased only in advanced stages in AD. These results show modulation of transduction pathways mediated by adenosine and suggest A1 and A2A receptors, PKA and PKC as promising pharmacological targets in AD.

# NMR MICRO-COILS AS AN ALTERNATIVE FOR CHEMICAL PROCESSES MONITORIZATION

J.M. Mateo, R.M. Sánchez, A. de la Hoz, A. Velders, A.M. Rodríguez, A. Juan, M.V. Gómez
Organic Chemistry


NMR spectroscopy is one of the most powerful techniques for structural determination. Nevertheless, its main disadvantage is the low sensitivity. One of the possibilities to improve the NMR sensitivity (SNR) is the employment of micro-coils integrated in the surface of the so-called NMR micro-chips (Figure 1), as SNR is inversely proportional to the coil diameter.

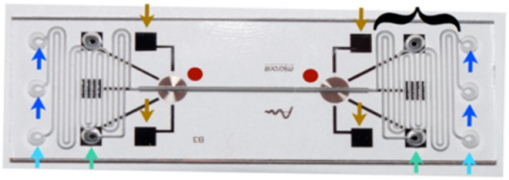

Figure 1. NMR micro-chip with planar micro-coils.

NMR micro-chips are very useful not only for being employed as micro-reactors but also for permitting micro-fluidic connections in order to carry out chemical processes in continuous flow mode. Taking into consideration this approach, we have coupled different chemical activation sources to the NMR spectrometer such as conventional heating,[1] microwave irradiation[2] and photochemistry[3] for monitoring several chemical reactions both inline and in situ detection.

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# NEW APPLICATIONS OF ION EXCHANGE RESINS IN ENOLOGY

R. Jurado, I. Hermosín

Food Science and Technology


Since the mid-twentieth century the technology of ion exchange resins has been using in the wine industry. Nowadays, ion exchange resins are mainly constituted by a crosslinked polymer matrix on which covalently bind ligands with net electrical charge.

In recent years, dozens of studies have shown the potential that have the ion exchange resins for the removal of oxidizable and oxidized compounds in musts and wines. For this reason, it is necessary to investigate this technology to produce quality wines at a lower cost for the winery.

This study aims at the reducing the concentration of phenolic compounds in white wines using anion-exchange resins without modifying the aromatic complexity and gustatory sensations.

On the experiences made, all the hydroxycinnamic acid derivatives, including free caffeic and p-cumaric acids and their respective esters with tartaric acid, (i.e., caftaric and cutaric acids), drastically decreased after the resin exchange treatment.

# NEW TECHNIQUE TO PRODUCE HYDROGEN: ELECTROCHEMICAL REFORMING OF ALCOHOLS

A.B. Calcerrada, A.R. de la Osa, F. Dorado, A. de Lucas-Consuegra

Chemical Engineering


Nowadays, hydrogen has attracted great interest as a future clean fuel for combustion engines and fuel cells. There are different processes to obtain hydrogen from a variety of materials. However, most hydrogen in the industry was produced by steam reforming of methane. Nevertheless, in the last years the electrochemical reforming of alcohols is developing as a new technique in order to obtain pure hydrogen and is based on the use of electrical power to split the chemically-bonded species by the electro-oxidation of the alcohol fuel. This process can take place in a Proton Exchange Membrane (PEM) electrolysis cell where the organic compound is supplied to the anodic chamber, and the hydrogen was obtained in the cathodic chamber (Figure 1).

This technique has some interesting advantages as:

- Lower reaction temperatures (<100 ºC) than catalytic steam reforming.
- Direct pure hydrogen production, separated from other reaction products.
- Easier and fast control of hydrogen production rate.
- Lower power demands than water electrolysis, since part of the energy required is provided by the organic molecule.

On the other hand, the electrochemical reforming of alcohols also presents some drawbacks as:

- It is an immature technology.
- Limited practical experience.
- Required development of more active catalyst anode and more stable membranes.
- High cost anodic catalyst typically based on Pt-Ru/C.

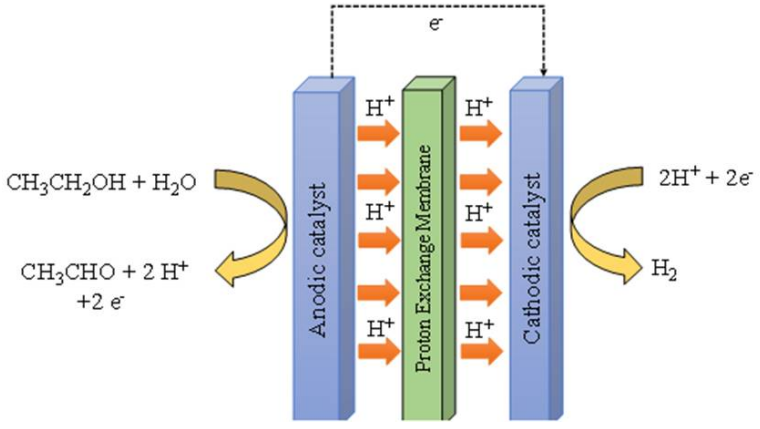


Figure 1. Schematic representation of the set-up used for the ethanol electro-reforming

# DIALKYLBORON GUANIDINATES: SYNTHESIS, STRUCTURE AND CARBODIIMIDE DE-INSERTION REACTIONS

A. Ramos, P. Montero, F. Carrillo-Hermosilla, R. Fernández-Galán, E. Villaseñor, A. Antiñolo, R. Rojas, A. Rodríguez
Inorganic Chemistry


Guanidinate anions are highly versatile and readily accessible ligands, which have been used in recent years as an alternative to cyclopentadienyl-based ligands coordinated to metals and main group elements with emerging applications in catalysis and materials science. The most common synthetic routes to access guanidinato compounds are: (i) insertion of carbodiimides in M-N bonds, (ii) deprotonation of guanidine with a metal alkyl, (iii) salt-metathesis reactions between a metal halide substrate and an alkali metal guanidinate.[1] Within this family of compounds, examples of boron guanidinates are scarce and most of them bear only halide substituents on boron. Thus, we turned our attention to the preparation of novel dialkylboron guanidinates through salt methathesis of "in situ" generated lithium guanidinates of the formulas Li[$(Me_2N)C(NR'_2)_2$] (R' = iPr, Cy) or Li[(iPrHN)C(NiPr)(NAr)] (Ar = Ph, 4-Me-$C_6H_4$ 4-tBu-C6H4) with chloroboranes ClBR"$_2$ (R" = Cy, Norbornyl) to give compounds $(Me_2N)C(NR'_2)_2BR"_2$ and [(iPrHN)C(NiPr)(NAr)]$BCy_2$ in fairly good yields. The solid-state structures of some of these species were confirmed through single-crystal X-ray diffraction analyses. Unexpectedly, we found that the symmetrical boron guanidinates undergo de-insertion reactions in solution, even at room temperature, to give the corresponding aminoboranes, $Me_2NBR"_2$, and carbodiimides, $C(NR'_2)_2$, which are in equilibrium with the parent guanidinates. However, the asymmetrically-coordinated guanidinato derivatives turned out to be more robust and only showed evidence of this type of reactivity at higher temperatures.

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# PHENOLIC COMPOSITION OF RED WINES ELABORATED FROM MINOR GRAPE CULTIVARS FROM THE SPANISH REGION OF LA MANCHA

J. Pérez, P.M. Izquierdo, E. García, S. Gómez, I. Hermosín

Food Science and Technology


The vine culture for winemaking is currently dominated by a relatively low number of worldwide spread grape cultivars. However, there are a large number of local or minor grape cultivars whose composition and potential to produce high quality wines have not been properly studied. The phenolic composition of red wines elaborated from little known red grape cultivars, namely Garnacho, Moribel, Benedicto, Mocatel Negro, Tinto Navalcarnero and Tinto Fragoso, which are native from the Spanish region of La Mancha (ca. 450,000 ha of vineyards), have been studied in the 2014 season with the aim of evaluate the enological potential of these minor grape cultivars. Individual phenolic compounds (anthocyanins, flavonols, hydroxycinnamic acid derivatives and flavan-3-ols) were determined by HPLC-DAD-ESI-MS/MS following methods previously described by our group.[1, 2] The red wines studied had total anthocyanins contents in a similar range to the red wines made from world-renowned Cabernet Sauvignon, Tempranillo, etc., being Tinto Fragoso the richest one. Regarding flavonol profiles, the 3-glucosides of the six common aglycones were found and Tinto Fragoso wines showed higher flavonol concentrations than the others. Hydroxycinnamic acid derivatives (HCADs) showed the characteristic profile of V. vinifera wines, being caftaric acid the main HCADs. Tinto Navalcanero wines had the lower flavan-3-ol monomers and proanthocyanidins contents.

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# SYNTHESIS OF BIOMATERIALS BASED ON RENEWABLE RESOURCES

J.C. de Haro, J.F. Rodríguez, A. Pérez, M. Carmona

Chemical Engineering


The increase of the petroleum price and the strengthening of environmental legislation play an important role for finding and developing new alternative raw materials to those from fossil fuel sources. In this way, vegetable oils and free fatty acids are considered the most important precursors to produce biomaterials and biofuels. Grape seed oil is a very abundant by-product at Castilla-La Mancha. This triglyceride is mainly composed by unsaturated fatty acids, which can be functionalized by different routes to obtain biomaterials. In this work, the unsaturations are transformed into oxirane rings; a more reactive functional group which can be attacked by compounds with active hydrogen atoms (water, alcohols, amines, carboxylic acids, etc.). Firstly, the epoxidation reaction should be optimized to avoid secondary reactions, namely hydrolysis and oligomerization. Further, different opening agents should be studied to produce a wide range of materials with different functionalities and properties. Additionaly, free fatty acids generated during oil refining can be used as raw material for synthesising other polymeric materials. Estolides, which are intermolecular esters of fatty acids (Figure 1), have a significant promise as biolubricant because of their good stability toward oxidation, lower pour point and higher viscosity index. These properties can be further improved by means of capping processes, such as esterification. Oleic acid is a good starting material because of its availability from different agricultural sources and its low cost.

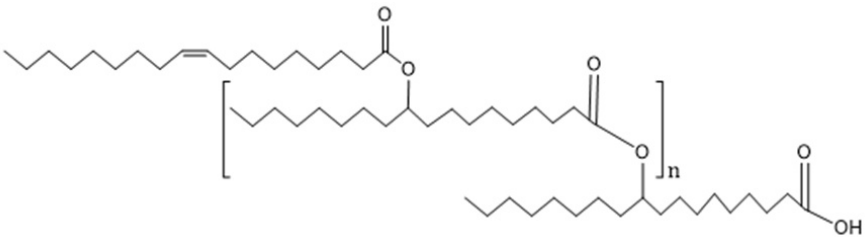


Figure 1. Estolide synthesized from oleic acid

# BIOMASS AS A RENEWABLE ENERGY RESOURCE. NEW METHODOLOGIES FOR CONVERSION OF LIGNOCELLULOSIC WASTE INTO BIOFUEL PRECURSORS

A. Lorente, C. Lucas-Torres, M.P. Sánchez-Verdú, A. Moreno
Organic Chemistry


Fossil fuels reserves are decreasing and its use causes high $CO_2$ emissions. Lignocellulosic biomass has been recognized as the most promising renewable resource for the production of high value bio-chemicals, for instance 5-hydroxymethylfurfural (HMF) and levulinic acid (LA). Our research group works on agrofood and lignocellulosic residues focusing on their carbohydrate contents. Six-carbon carbohydrates are dehydrated in acidic medium at high temperature to obtain HMF and LA, which are interesting compounds as they involve the obtaining renewable precursors for the production of plastics and biofuels. Considering that, the aim of this work involves the carbohydrate dehydration from beer bagasse, which is generated in beer industries. Thereby environmentally-friendly techniques, such as microwave radiation as energy source, will be used meeting some of the Green Chemistry Principles. Thermogravimetric analysis (TGA) allow us to characterise beer bagasse and NMR spectroscopy provides a tool for the identification and quantification of these “platform” compounds and compare these results when the dehydration is carried out under conventional heating.

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# SEPARATION TECHNIQUES COUPLED TO ICP-MS FOR THE DETERMINATION OF GOLD NANOPARTICLES AND DISSOLVED GOLD SPECIES IN CULTURE MEDIUM AND CELLS

S. López, N. Rodríguez, R. Serrano, R.C. Rodríguez, A. Ríos
Analytical Chemistry


In the last decades, the use of gold nanoparticles (AuNPs) has rapidly increased with applications in biomedicine and sensing devices. At the same time, there is also a growing concern about their potential toxicity on biological systems. Nanotoxicity test in vitro with cells are applied to evaluate this risk but the formation of protein coating around the NPs and the liberation of ions may impact the biological response. In order to obtain a correct interpretation of the toxicity results, methods to detect and characterize AuNPs in culture medium and cells are an urgent need. For this purpose, the use of separation techniques coupled to inductively coupled plasma mass spectrometry (ICP-MS) is a promising option. Thus, the aim of this study was to compare two hydrodynamic separation techniques, such as reversed-phase liquid chromatography (HPLC) and asymmetric flow field flow fractionation (AF4), coupled ICP-MS, for the study of AuNPs and dissolved species in culture medium (DMEM) and cells (HeLa) used in cytotoxicity tests. In this work, liquid chromatography allowed the separation of gold species ($Au^{3+}$ and AuNPs of different size) in a single chromatographic run using phosphate buffer modified with sodium dodecyl sulphate as mobile phase. The matrix had a significant impact on the behaviour of both $Au^{3+}$ and AuNPs. In the case of 10 nm AuNPs, a shift towards minor retention time was observed after a 24 hours incubation period in the culture medium, which suggests a “protein corona” effect. Moreover, methodology based on AF4 has been applied for the detection and characterization of AuNPs in DMEM and an increment in the size distribution was observed, which can be associated with protein corona. Besides, the detection of $Au^{3+}$ released from AuNPs in DMEM has been confirmed by both separation techniques.

Acknowledgments: Project MINECO CTQ-2013-48411-P and predoctoral contract MINECO BES-2014-069095, and project PEIC-2014-001-P from Junta de Comunidades de Castilla – La Mancha.

# VOLATILE AND SENSORY PROFILE OF VERDEJO WHITE WINES TREATED WITH OAK CHIPS AT DIFFERENT WINEMARKING STAGES

J.A. Delgado, E. Sánchez-Palomo, R. Alonso Villegas, M.A. González-Viñas

Food and Science Technology


This paper reports on a complete study of the effect of wood, in the form of oak chips, on the volatile composition and sensory characteristics of Verdejo wines added at different stages of the fermentation process. Verdejo control wine was made following traditional winemaking process, without oak chips. Oak chips were added to the rest of the wines in one dose rate (7 g/L) at two different stages of the winemaking process: during alcoholic fermentation (AF) and post-fermentation in contact along one week (wine maturation). Aroma compounds were analyzed by Gas Chromatography–Mass Spectrometry (GC–MS). Sensory profile was evaluated by experienced wine-testers. Wines fermented with oak chips during alcoholic fermentation showed higher concentrations of the ethyl esters of straight-chain fatty acids, ethyl, hexyl, isoamyl acetates and superior alcohols than control wines. The highest concentrations of benzene compounds, oak lactones and furanic compounds were found in both wines in contact with oak chips but wines treated with oak chips after alcoholic fermentation presented less concentration of these compounds. It is clear that the use of wood chips gives rise to a different sensorial profile of wines depending at what point of the winemaking process the chips are added. Verdejo control wine presented a sensory profile characterized by fruity, fresh, green apple, citrics, green y tropical fruit notes. Higher intensities of woody, coconut, vanilla, toasty and toffee descriptors are obtained when a large dose rate of chips is employed. All these treatments with oak chips provide another alternative to traditional winemaking methods as its use gives rise to improve and enhance the chemical and sensory profile of wines depending of the point of addition.

# PREPARATION OF PLATINUM COMPLEXES AS ANTICANCER AGENTS

S. Blázquez, M.C. Carrión, B.R. Manzano. F.A. Jalón

Inorganic Chemistry


Fighting against cancer is one of the subjects in which many scientists spend a lot of time of their research. Many different drugs, which have shown therapeutic activity against cancer, have been developed during the latest years. Nevertheless, the high reactivity of these molecules, together with their low selectivity and the resistance acquired by some cells, are the main problems of these treatments. Many of these molecules are based on Pt(II). They exhibit cytotoxic activity and they are commonly used in chemotherapy. Cisplatin is the most used drug for tumor treatments —lung, ovary, head and neck.[1] — The widely accepted mechanism consist on the binding of the complex of Pt (II) to the strands of DNA. By this union, the cellular death by apoptosis is triggered. The lack of selectivity of cisplatin and other drugs, targeting both healthy and cancer cells, causes a huge number of negative side effects. The purpose of this research is the synthesis of new complexes that exhibit similar or higher cytotoxicity, but with an improved selectivity against cancer cells. In the first place, N,N-chelating ligands are combined with substituents that improve the transport of the drug through the cell wall. The subsequent step would be the oxidation to the less toxic Pt (IV) to get the reduction to Pt (II) in the cancer cells. This would reduce the side effects increasing the selectivity.

Knowledgements: MINECO grant (CTQ2014-58812-C2-1-R) and Programa Propio UCLM for financial support. S.B. thanks the Programa Propio for a Master fellowship.

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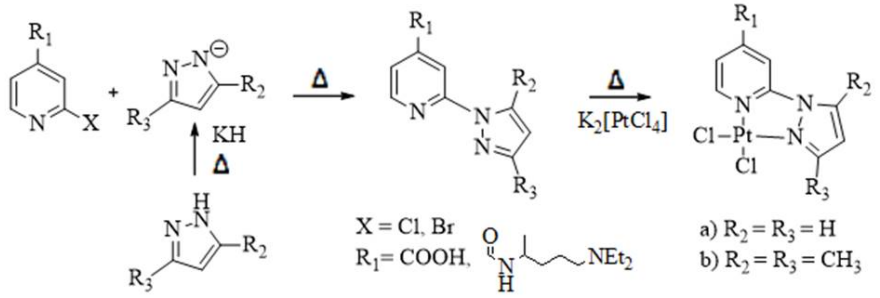

# PRECONCENTRATION STRATEGIES WITH NANOPARTICLES IN BIOLOGICAL SAMPLES FOR ANALYSIS BY CAPILLARY ELECTROPHORESIS

I. Lizcano, J. Rodríguez, G. Castañeda

Analytical Chemistry


An analytical process usually has several steps, such as sampling, sample preparation, separation, detection, data handling and treatment, to offer the required results. Of these steps, sample preparation might be the most important when target analytes are in complex matrices or direct analysis is not practical due to the lack of selectivity and sensitivity. Numerous potential interferents and low concentrations of analytes make a previous extraction procedure, which usually involves isolation and enrichment of the analytes, necessary. Among different separation and preconcentration techniques, solid phase extraction (SPE) together with precipitation are the most common because are simple and faster operation. The development of new extraction techniques and improvement of existing techniques using novel extraction materials are the main trends in this research area. Regarding the latter issue, nanomaterials are promising tools. In this work we have used different methods of pretreatment of the serum sample in order to preconcentrate or eliminate interference that is presented at the time of the determination by Capillary Electrophoresis (CE) of two oncologic compounds (Dabrafenib and Trametinib) simultaneously used in the treatment of cancer skin. It has made a comparative study of classical extraction techniques, such as precipitation or solid phase extraction (SPE) and extraction with different nanomaterials such as, magnetic nanoparticle modified with SDS or multi-walled carbon nanotubes, single carbon nanotubes (SWCNTs) and multi-walled carbon nanotubes (MWCNTs). Of the different pre-treatment systems, the MWCNT has been showing as the better strategy, these materials were characterized by their high surface areas, and they could absorb molecules via non-covalent force, such as hydrogen bonding, π-π stacking, electrostatic forces, Van der Waals forces and hydrophobic interactions

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# PESTICIDES REMOVAL WITH AEROBIC ACCLIMATED BACTERIAL CULTURE

B. Carboneras, J. Villaseñor, F.J. Fernández-Morales

Chemical Engineering

Nowadays pesticides are essential for the correct development of crops. The use of pesticides have caused many environmental problems such as increased soil fertility loss, soil acidification, increased weed species resistance and loss of biodiversity. These chemicals can generate problems in living organisms, including humans. Because of the problems described, it is important to develop techniques in order to minimize the effect of pesticides. One of the methods that can be used takes advantage of the ability of microorganisms to remove pollutants. In this context, the aim of this work was to evaluate the aerobic biodegradability of a commercial herbicide solution, based on oxyfluorfen. The experimental system used in this work consists of batch reactors. The reactors have a continuous shaking and operated at a constant temperature. The volume of each reactor is 500 ml and they are open to the atmosphere in order to allow the oxygen transfer from the atmosphere to the liquid bulk. Different concentration of oxyfluorfen, ranging from 84 to 495 ppm, and different temperatures, ranging from 15 to 30°C were studied. In all the cases, the length of tests was 72 hours. In order to ensure the availability of trace minerals, a nutrient solution was added to the experiments. In previous researches, it was observed the existence of a lag phase in biodegradability studies of halogenated pesticides. For this reason, an acclimated bacterial culture was used in this experimentation. The evolution of the pesticide, the biomass concentration and the total organic carbon (TOC) were analyzed along all the tests performed. The complete degradation of oxyfluorfen was achieved at 15°C in all cases. The best TOC removal was achieved at 30°C. In all experiments there is a residual value of TOC that may be because the formation of a reaction intermediate during microbial decomposition. This compound could be more difficult to eliminate by biodegradation. At the highest temperature, 30°C, the disappearance of low concentration pesticides solutions was faster. However, temperature inhibition problems and toxicity problems appeared when working at high concentrations.

# DETERMINATION OF CATECHINIC ANTIOXIDANTS IN TEA

J.A. Murillo, L.F. García, E. Valverde

Analytical Chemistry


Antioxidants are especially important substances in the human diet, as they are able to slow or prevent oxidizing cells in the presence of oxygen; namely, are responsible for counteracting the harmful effects of free radicals. Heimler et al. [1] have indicated that plant polyphenols exhibit the ability to neutralize these radicals. For example, tea leaves, which are used to prepare infusions, are natural sources of antioxidants. This communication presents an analytical method for determining the concentration of antioxidants in tea samples. The method is based on the deactivation of reactive oxygen species which are formed during the sodium perborate decomposition, by the biophenols present in the infusion. These free radicals promote luminol oxidation, manifested by the emission of radiation in the visible region of the spectrum. However, if these biophenols, exhibiting the ability to inactivate free radicals, are in the middle, the chemiluminescent emission will decrease in proportion to the antiradical activity of such molecules.[2] A continuous flow system is used to carry out the proposed study. The catechinic antioxidant compounds from the tea infusions are firstly chromatographically separated and then these are guided to a chemiluminescent detector where the reaction with the mixture luminol-perborate-Co(II) takes place. The antiradical activity of different catechinic antioxidants is measured on the basis of the magnitude of the chemiluminescent inhibition signals.

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# FORMATION AND EVOLUTION OF THERMOCONVECTIVE VORTICES: APPLICATION TO ATMOSPHERIC PHENOMENA

D. Castaño, M.C. Navarro, H. Herrero

Applied Mathematics

Dust devils are columnar, ground-based whirlwinds, common in dry regions, observed in daytime and made by the dust picked up from the ground.[1,2] They are formed when surface isolation leads to a superadiabatic lapse rate, causing an unstable stratified atmosphere and strong convection.[2,3] They have a vortical structure, characterized by a spiral up motion around an eye. Dust devils frequently contain subvortices, small "parasites" or secondary circulation embedded in the primary whirl (dust devil) that normally form near the center of the dust devil and follow essentially concentric circular paths about the dust devil center.[3,4,5,6] In this talk, we show that thermoconvective instability is the responsable for the formation of secondary whirls embedded in the primary axisymmetric vortex. We study the influence of the inner radius and the sharpness of the temperatura profile at the bottom on these parasitic whirls. In [3,4,5,6] it is reported the formation of subvortices embedded in dust devils that normally appear near the center of the dust devil and follow essentially concentric circular paths about the dust devil center. The base on the generation of these subvortices and their evolution is thermoconvective. Our numerical results reinforces this idea.

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# ADRENOCEPTORS SUBCELLULAR LEVELS IN WISTAR RATS: EFFECTS OF CENTRAL INFUSION OF LEPTIN AND CALORIC RESTRICTION

L. Mazuecos, V. López, A. Fernández, N. Gallardo, A. Andrés

Biochemistry

The hypothalamus in the Central Nervous System continuously transduces input from neural, hormonal and nutrient-related signals into responses that maintain both energy- and glucose-homeostasis. Afferent signals such as the hormone leptin convey information to the hypothalamus regarding long-term energy stores. After receiving information, the hypothalamus sends signals to peripheral organs, including the liver, to keep homeostasis. The hypothalamus signal to the peripheral organs by stimulating the autonomic nerves. Sympathetic hepatic nerves can modulate hepatocyte function by direct action of their neurotransmitter noradrenaline on α- and β- adrenergic receptors. Alterations in connections between the brain and the liver through the adrenergic system could favor the accumulation of hepatic fat and the development of diseases such as fatty liver. In order to reveal the involvement of the autonomic nervous system in the central leptin regulation of liver function, we focus this study on neuroendocrine connections between the hypothalamus and the liver. To carry out this study, osmotic pumps were implanted, by stereotaxic surgery, in the brain of male 8-month-old Wistar rats. Animals were infused with leptin (0.2 µg/d) or its vehicle (PBS) for 7 days. Our results show the effects of intra-cerebroventricular leptin administration on total and sub-celullar levels of adrenergic receptors, in order to understand the ability of leptin to modulate the hepatic metabolism through Sympathetic Nervous System and shed new knowledge about anti-steatotic and anti-diabetic effects of leptin.

# STUDY OF ANTIMICROBIAL ACTIVITY OF SEVERAL YEAST SPECIES ISOLATED FROM FOOD AGAINST BACTERIAL PATHOGENS

M. Gómez, M. Fernández-González

Food Science and Technology

Chemical preservatives are commonly used to extend the life and improve the safety of food by inhibiting the growth of microorganisms. However, in response to the increasing consumers demand for so-called minimal processing food or with the least amounts of additives, it has begun to promote alternative and safety methods of food preservation, such as the use of natural antimicrobials from lactic acid bacteria or yeasts. There are very few studies of yeast antimicrobial activity against pathogenic bacteria in food and therefore, this work aims to study the inhibition of growth of five pathogenic microorganisms of food interest (Salmonella enteritidis, Escherichia coli, Staphylococcus aureus, Listeria monocytogenes and Clostridium perfringens) using 208 yeast strains from 15 different genera and more than 40 species isolated from food ecosystems and stored at the University of Castilla-La Mancha collection. It have been found that 90 of assayed strains showed antimicrobial activity in varying degrees against any of the pathogen tested, being Staphylococcus aureus and Clostridium perfringens, more sensitive to yeasts action unlike Escherichia coli and Salmonella enteritidis.

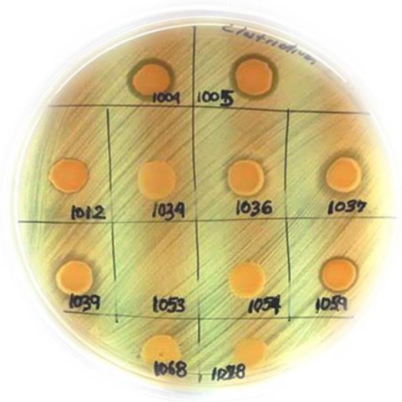


Figure 1. Inhibition of Clostridium perfringens by Metschnikowia pulcherrima y Kluyveromyces thermotolerans

# MORPHOLOGY SEPARATION OF VINYL-TERMINATED GOLD NANOPARTICLES (AuNPS) BY CAPILLARY ELECTROPHORESIS-DIODE ARRAY DETECTOR (CE-DAD)

C. Adelantado, M. Zougagh, A. Ríos
Analytic Chemistry


An easy and rapid CE-DAD methodology has been developed in order to identify and separate gold nanoparticles (AuNPs) according to their shapes –octahedra and triangles–, these AuNPs being previously synthesised and dissolved in cetyl trimethyl ammonium chloride (CTAC). A mixture of both shapes was injected into the electrophoretic system to achieve an adequate separation of them all in a mixed buffer solution of 10 mM tris(hydroxylmethyl)aminomethane (Tris) and 20 mM sodium dodecyl sulfate (SDS) at pH 8.5,[1] and they showed maximum absorption at 200 and 580 nm wavelength when analysed by UV-Vis spectrophotometry. Different peaks in CE-DAD were obtained for each structure (Fig. 1). A study of the influence of temperature and pH on the synthesis of the different structures of AuNPs was conducted and it was concluded that the ratio between triangles and octahedra decreased to a great extent.

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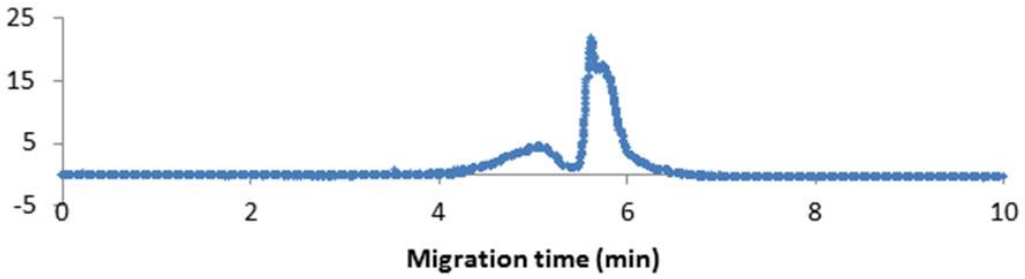


Typical electropherogram after the injection of a mixture of triangular and octahedral AuNPs (the earliest and the latest eluting, respectively).

# HELICAL CHIRAL ALUMINIUM COMPLEXES FOR THE SYNTHESIS OF CYCLIC CARBONATES AND POLYCARBONATES

M.A. Gaona, A. Lara-Sánchez, A. Otero, J.A. Castro-Osma, J. Fernández-Baeza

Inorganic Chemistry


Lack of renewable carbon sources to produce energy and the increasing concentration of carbon dioxide in the atmosphere is leading into using $CO_2$ as a sustainable chemical feedstock for the chemical industry. One of the most studied reactions using carbon dioxide as a reactant is its reaction with epoxides in order to get either cyclic- or polycarbonates (Scheme 1). These reactions prove to be 100% atom-economical and they are amongst the most important commercial processes using $CO_2$ as a starting material. Both synthesis of cyclic- and polycarbonates from carbon dioxide have been extensively investigated recently.[1]

Inspired by the excellent activity displayed by aluminium complexes as catalysts for these reactions,[2] the work described herein shows a rational development of a new family of helical chiral bimetallic and trimetallic aluminium complexes containing an acetamidate or thioacetamidate scorpionate ligand-bridge between aluminium centres and their application as catalysts for the conversion of epoxides into their corresponding cyclic carbonates and polycarbonates.

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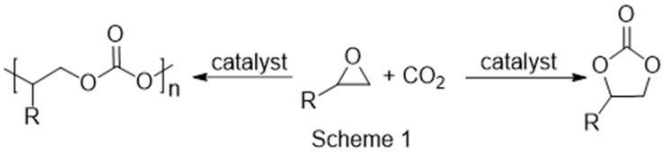


Scheme 1

# ANALYZING THE ETIOLOGY OF METABOLIC DISORDERS BY MEANS OF LIPIDOMIC ANALYSIS

V. López, N. Gallardo, A. Huelva

Biochemistry

Lipidomic permits to analyze the lipidome, the entire collection of chemically distinct lipid species in a cell, an organ or a biologycal system. For this reason Lipidomic plays an essential role in defining the biochemical mechanisms underlying lipid-related disease process through determination of alterations in celular lipid signaling, metabolism, trafficking and homeostasis. Wistar rats like humans, increase body weight and adiposity, become hypertrigliceridemic and hyperleptinemic with aging, and our previous results point out that ageing associated alterations are responsible of this situation. Thus, we hypothesized that these factors could be implicated in the development of insulin resistance with aging. It is well known that the hypothalamus acts sensing the level of nutrients allowing the brain to modulate energy intake and energy expenditure in order to maintain energy homeostasis. Besides body adiposity is regulated by the hormones leptin and insulin which reduce food intake while increase energy expenditure via actions on target neurons found in the hypothalamus. For all these reasons we focus our attention in this organ. This comprehensive analysis provides information about the total content and relative abundance of specific lipid species in the hypothalamus during aging, that could be correlated with the development of metabolic disorders. This information will help us to understand the mechanisms involved in the development of insulin and leptin resistance, and we will be closer to find the origin and therefore closer to get a solution.

# ELECTROCHEMICAL SYNTHESIS OF PEROXIACETIC ACID USING CONDUCTIVE DIAMOND ELECTRODES

I. Moraleda, C. Sáez, J. Llanos, M.A. Rodrigo

Chemical Engineering


Organic peroxyacids belong to a group of oxidants characterized by the presence of a peroxy group (-O-O-). One of the most important organic peroxyacids is peroxyacetic acid (PAA), which is also known as peracetic acid. PAA is used as bleaching agent and in the industrial synthesis of epoxides. The commercial PAA is supplied in equilibrium with hydrogen peroxide, acetic acid and water. Hydrogen peroxide plays a key role in PAA electrosynthesis, favoring the chemical equilibrium of PAA (according to Eq. 1) and therefore, its stability. For this reason, the electrochemical generation of hydrogen peroxide on the cathode surface can improve the synthesis of PAA.

$$CH_3COOH + H_2O_2 \rightarrow CH_3COOOH + H_2O \quad \text{Eq. [1]}$$

Recently, electrochemical oxidation whit boron doped diamond (BDD) anodes have become one of the most promising technologies in the treatment of industrial waste pollutions whit organics and in the electrosynthesis or oxidants. BDD anodes have higher chemical and electrochemical stability, as well as higher current efficiency in the above-mentioned processes. The aim of this work is the study of the technical viability of the electrochemical synthesis of PAA with BDD anodes, optimizing the operating conditions that maximize the production of this organic peroxyacid. For this, the influence of, current density, pH, cell configuration and raw material in the PAA production rate and efficiency has been studied.

Acknowledgements

This work have been supported by JCCM (Junta de Comunidades de Castilla-La Mancha) through the project PEII-2014-039-P.

# DECORATION OF MULTI-WALLED CARBON NANOTUBES WITH METAL NANOPARTICLES IN SUPERCRITICAL CARBON DIOXIDE: A NOVEL APPROACH FOR THE MODIFICATION OF SCREEN PRINTED ELECTRODES

V. Moreno, E.J. Llorent-Martínez, M. Zougagh, A. Ríos
Analytical Chemistry


Functionalized multi-walled carbon nanotubes (MWCNTs) have been decorated with metal nanoparticles in supercritical dioxide medium. This approach permits the rapid and simple decoration of carbon nanotubes with the metal of choice. The prepared nanomaterials were used to modify screen-printed electrodes, improving their electrochemical properties and allowing to obtain a wide range of working electrodes based on carbon nanotubes. A mixture of acids functionalization of MWCNTs is used as a means to facilitate the deposition of metals. These electrodes were applied to the amperometric determination of pyridoxine (Vitamin $B_6$) in food and pharmaceutical samples. Specifically, this method was applied in food such as dietary supplements, multivitamin preparations and energy drinks. Using Ru-nanoparticles-MWCNTs as the working electrode, better results were obtained. The limit of detection was $0.8 \times 10^{-6}$ mol $L^{-1}$. These parameters represented a 3-fold increase in sensitivity compared to the use of bare MWCNTs or other carbon-based working electrode.

Acknowledgments: The Spanish Ministry of Economy and Competitiveness (MINECO) and JJCCC Castilla-La Mancha are gratefully acknowledged for funding this work with Grants CTQ2013-48411-P and JCCM PEIC-2014-001-P, respectively. E.J. Llorent-Martínez acknowledges the financial support from the UCLM Research Plan. The support given through an “INCRECYT” research contract to M. Zougagh is also acknowledged.

# EFFECTS OF FEBRILE SEIZURES ON ADENOSINE RECEPTORS IN NEONATES

M. Crespo, D.A. León-Navarro, M. Martín

Health Science


Febrile seizures have been associated with the development of epilepsy but the underlying mechanism is still poorly understood. Although febrile seizures are commonly related to the brain cortex, however, studies carried out in the last two-three decades have suggested that other sub-cortical areas, such as the cerebellum, could be also involved. In that sense febrile seizures are one of the most typical convulsive disorders in the children between 3 months and 6 years corresponding to 2 weeks of life in rodents, stage at which the cerebellum is still under development. Adenosine is a purine nucleoside, widely recognized as an endogenous modulator of neuronal excitability, which exerts potent neuroprotective and anticonvulsant actions in the brain through adenosine receptors binding. We previously showed short term modulation of A1 and A2A adenosine receptors and 5'-nucleotidase activity in cortex from rat brain following hyperthermia-induced seizures, suggesting a possible neuroprotective role of adenosine. The aim of the present work was to investigate whether both receptors and 5'-nucleotidase activity could also be modulated in the cerebellum in response to hyperthermia-induced seizures. The hyperthermia treatment was carried out, as described previously by our group, using the hair dryer model. Neonates were sacrificed 48 hours, 5 and 20 days after hyperthermia seizures and cerebellar plasma membranes were isolated. The effect of fever seizures on A1R and A2AR was studied by radioligand binding assays using [$^3$H]DPCPX and [3H]ZM241385 as radioligands, respectively. A1Rs were significantly increased after 48 h of hyperthermia and no significant differences were observed at 5 or 20 days. However, A2ARs were affected in a biphasic manner being decreased after 48 h and increased after 5 and 20 days of hyperthermia. Changes on receptors were accompanied by affectation of 5'-nucleotidase activity. These results suggest that adenosine could exhibit a possible neuroprotective role on hyperthermia seizures also in cerebellum.

# DOMAIN DECOMPOSITION NUMERICAL METHODS APPLIED TO RAYLEIGH-BÉNARD PROBLEMS

M.R. Ferrández, F. Pla, H. Herrero

Applied Mathematics

In Rayleigh-Bénard problems, a fluid layer is heated from below and, as a consequence, a convective motion appears for large enough vertical temperature gradients.[2] The aim of this work is to study a non-overlapping domain decomposition method for various Rayleigh-Bénard convection problems with different heating conditions. Three cases are studied depending on the type of heating applied at the bottom boundary: uniform heating, local heating modelled by a Gaussian profile for the temperature and heating half cell described by an arctangent function. The problem is defined in a rectangular domain which is partitioned into two or more subdomains with appropriate interface conditions. The spectral Legendre collocation method is used to discretize the problem. Two perspectives of resolution are considered, a direct algorithm[3] or an iterative procedure.[1] Great improvements are achieved with the domain decomposition techniques in condition numbers, size of the matrices, numerical errors and computing times. Gibbs phenomenon related with singularities at the boundary is avoided. The method distinguished the local heating boundary condition to properly describe the behaviour of the fluid.

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# MICROWAVE HEATING FOR THE CONVERSION OF AGRO-INDUSTRIAL WASTE INTO VALUABLE CHEMICALS AND MATERIALS

C. Lucas-Torres, A. Lorente, B. Cabañas, A. Moreno

Organic Chemistry


High demand on fossil feedstocks represents a challenge, as the search for substitutes to help keeping the world resources at an acceptable level is of great importance.[1] In this sense, we propose the use of waste generated from agricultural industries as a renewable source of fuels, chemicals and materials. Microwave irradiation may be applied as main sustainable technology in several processes.[2]

Lignocellulosic biomass contains cellulose, hemicellulose, lignin and, in the primary cell wall, pectin. The microwave treatment of the carbohydrate fraction is of special interest in the biofuel field.[3] Lignin is known as the most important source of antioxidant phenolics. However, this presentation will focus on the pectin, as an interesting gelling agent, and cellulose extraction from mango peel waste.

Pectin is conventionally extracted at high temperatures under acidic conditions from several fruits.[4] Low temperature microwave-assisted acid-free extraction of pectin allows to obtain higher yields from three different mango cultivars, comparing with the conventional conditions. Structural studies on the de-pectinated peel reveal a cellulose composition, which can be isolated. Interestingly, a second microwave treatment on these residues retained mesoporosity whilst significantly increasing surface area and pore volume,[5] proposing a new material with adsorbent or catalytic applications.

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## En el próximo número de Molécula...

En el número de junio incluiremos los actos de investidura de nuevos doctores "Honoris causa", el campus científico tecnológico, las jornadas de catálisis y recopilaremos las Tesis defendidas y las Conferencias impartidas en los dos últimos meses. También nuestras habituales secciones de investigación y cafetería.

# I PREMIO CIENCIA JOVEN 2016

La pasada edición del Simposio Ciencia Joven incorporó como novedad la convocatoria del **"I Premio Ciencia Joven"** del X Simposio de Ciencia Joven de la Facultad de Ciencias y Tecnologías Químicas de Ciudad Real que le fue otorgado a la joven investigadora ***Gema María Durán Lizcano*** por su contribución científica *"The role of quantum dots for the development of analytical methodologies"* y por su trayectoria investigadora.

**Gema María Durán Lizcano**

*"I Premio Ciencia Joven"*

*del X Simposio de Ciencia Joven de la Facultad de Ciencias y Tecnologías Químicas.*

# LAS EDICIONES ANTERIORES

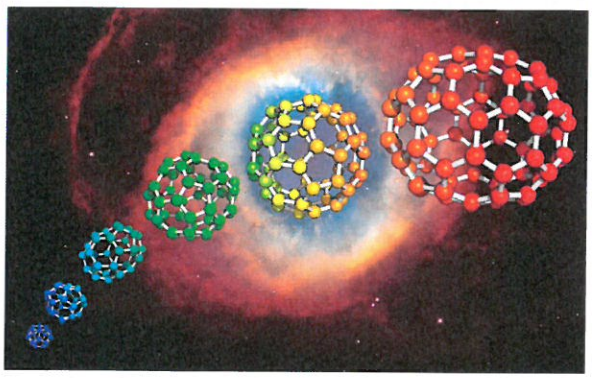
## Jornadas de Ciencia Joven:

| FECHA | ACTUACIÓN |
|---|---|
| Abril de 2007 | CIENCIA JOVEN. Un foro de debate de jóvenes investigadores |
| De mayo a junio de 2008 | II JORNADAS DE CIENCIA JOVEN. Un foro de debate de jóvenes investigadores |
| De abril a junio de 2009 | III JORNADAS DE CIENCIA JOVEN. Un foro de debate de jóvenes investigadores |
| De abril a junio de 2010 | IV JORNADAS DE CIENCIA JOVEN. Un foro de debate de jóvenes investigadores |
| De abril a junio de 2011 | V JORNADAS DE CIENCIA JOVEN. Un foro de debate de jóvenes investigadores |
| De mayo a junio de 2012 | VI JORNADAS DE CIENCIA JOVEN. Encuentro de jóvenes investigadores |
| 23-24 de mayo de 2013 | VII SIMPOSIO CIENCIA JOVEN |
| 22-23 de mayo de 2014 | VIII SIMPOSIO CIENCIA JOVEN |
| 21-22 de mayo de 2015 | IX SIMPOSIO CIENCIA JOVEN |
| Del 8 al 10 de junio de 2016 | X SIMPOSIO CIENCIA JOVEN |

UNIVERSIDAD DE CASTILLA-LA MANCHA

FACULTAD DE CIENCIAS Y TECNOLOGÍAS QUÍMICAS

# FACULTAD DE CIENCIAS Y TECNOLOGÍAS QUIMICAS



## JORNADAS DE CIENCIA JOVEN

**Para más información consultar con:**

*Nuria Barrajón* [Nuria.Barrajon@uclm.es]

*Iván Rivilla* [Ivan.Rivilla@uclm.es]

*Andrés Garzón* [Andres.Garzon@uclm.es]

**Patrocina**

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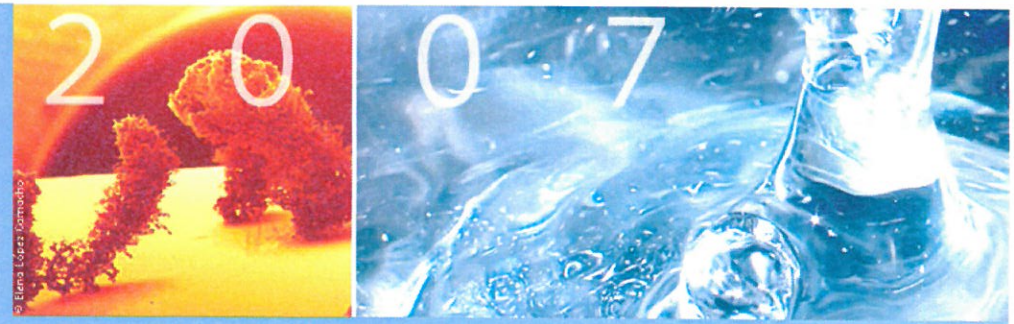
**ALAMBIQUE** *(Asociación de Antiguos Alumnos y Amigos de la Facultad de Ciencias Químicas )*

**Facultad de Ciencias Químicas**
**Ciudad Real, de abril a junio de 2007**




AÑO de la CIENCIA 2007

# CIENCIA JOVEN

## Un foro de debate de jóvenes investigadores

# mes de abril

UCLM
UNIVERSIDAD DE CASTILLA-LA MANCHA

**CIENCIA JOVEN** es una iniciativa que parte de decanato y es desarrollada por jóvenes investigadores de la **Facultad de Ciencias Químicas de Ciudad Real**.

## ¿EN QUÉ CONSISTE?

En una serie de charlas cortas que serán impartidas exclusivamente por jóvenes investigadores de nuestra facultad, los viernes, de 12:00 h a 13:00 h, en el salón de actos. Tras las charlas se dará paso a un breve coloquio sobre algunos de los temas que se hayan abordado durante la sesión y terminaremos con un aperitivo en el *hall* de la facultad.

## ¿QUÉ PERSEGUIMOS?

Poner en contacto a los jóvenes investigadores de nuestra facultad.

Dar a conocer las investigaciones que se están llevando a cabo en otras áreas.

Acercar a los alumnos al mundo de la investigación.

…y en definitiva fomentar las buenas relaciones de todas las personas que trabajamos o estudiamos en esta facultad.

## ¿A QUIÉN VA DIRIGIDO?

A los jóvenes investigadores de la facultad a través de la participación activa en las charlas o en los coloquios.

A cualquier investigador de la facultad cuya curiosidad científica no se limite sólo a su ámbito de trabajo.

A los alumnos de Químicas, Ingeniería Química y Tecnología de los Alimentos, cuya asistencia a estar jornadas podrá ser convalidada por créditos de libre configuración.

## Viernes 13 de abril

**Aurora Gómez-Rico Rodríguez-Barbero.** *Estudio de las condiciones de batido sobre la composición fenólica y volátil en el proceso de obtención del aceite de oliva virgen.* **Dpto. de Tecnología de los alimentos.**

**Florentina Villanueva García.** *Degradación atmosférica del 3-metilfurano con átomos de cloro.* **Dpto. de Química Física.**

## Viernes 20 de abril

**Mª Luz Sánchez Silva.** *Desarrollo de microcápsulas conteniendo materiales de cambio de fase para su aplicación en nuevos tejidos.* **Dpto de Ingeniería Química.**

**Abel de Cozar Ruano**. *"Química computacinal como herramientaen síntesis orgánica"*. **Dpto. de Q. Orgánica**

**Virginia Rodríguez Robledo.** *Determinación de psicofármacos en muestras biológicas mediante técnicas de separación.* **Dpto. Analítica.**

## Viernes 27 de abril

**Virginia Sánchez Arias.** *Valoración de biorresiduos mediante tratamiento aerobio: compostaje.* **Dpto. Ingeniería Química.**

**Nuria Barrajón Simancas.** *Estudio de la implantación de levaduras seco activas en fermentaciones vínicas.* **Dpto. Tecnología de los Alimentos.**

**Andrés Garzón Ruiz.** *Papel del radical Cl en la química de la troposfera. Diferentes técnicas experimentales y teóricas aplicadas al estudio de sus reacciones.* **Dpto. de Química Física.**

**CIENCIA JOVEN** es una iniciativa de la ***Facultad de Ciencias Químicas de Ciudad Real***, para la divulgación científica de trabajos desarrollados por ***Jóvenes Investigadores*** en la Comunidad de Castilla-La Mancha.

## ¿EN QUÉ CONSISTE?

Durante el mes de ***Mayo*** un grupo de ***jóvenes investigadores de la Facultad de Químicas*** darán a conocer mediante una serie de charlas divulgativas el trabajo de investigación que desarrollan dentro del campo de la Ciencia, mientras que en el mes de ***Junio*** será un grupo de ***jóvenes, doctorados por nuestra Universidad,*** así como algunos ***investigadores externos***, los que nos darán una visión más general sobre la investigación en España, tanto en instituciones públicas como en la empresa privada.

## ¿QUÉ PERSEGUIMOS?

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- Acercar a los alumnos al mundo de la investigación.

## ¿A QUIÉN VA DIRIGIDO?

A los jóvenes investigadores de la Facultad y la región a través de la participación activa en las charlas.
A cualquier investigador de la Facultad cuya curiosidad científica no se limite sólo a su ámbito de trabajo.
A los alumnos de Químicas, Ingeniería Química y Tecnología de los Alimentos que quieran conocer mejor el mundo de la ciencia así como las distintas líneas de investigación que se siguen en nuestra Facultad.

**Patrocinan:**

Merivilab, S.A.
MATERIAL Y EQUIPOS DE VIDRIO DE LABORATORIO, S.A.

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Consejería de Educación y Ciencia

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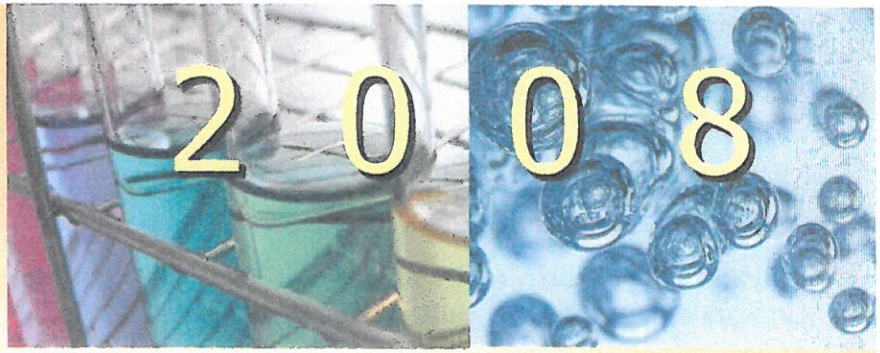
ACMIQ
(Asociación Castellano-Manchega de Ingenieros Químicos)


**Más información:**
*Carlos Alonso [Carlos.Amoreno@uclm.es]*
*Maria Arevalo [Maria.Arevalo@uclm.es]*
*María Pilar Fernández [Mariapilar.Fernandez@uclm.es]*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# II Jornadas de CIENCIA JOVEN

## Un foro de debate de jóvenes investigadores

**Facultad de Ciencias Químicas**
**Ciudad Real, de mayo a junio de 2008**


**Cómite Organizador:**
***Carlos Alonso Moreno, Rebeca Reguillo Carmona, Maria Arevalo Villena, Carmen jimenez borja, Abel de cozar ruano, Maria pilar fernandez ronco***

## Programación Mayo 2008

(Salón de Actos de la Facultad de Ciencias Químicas)

12:00 -Viernes 9 de mayo 2008 Apertura *II Jornadas Ciencia Joven*

- **"Nanotubos: una nueva forma de carbono". *Juan de Mata Muñoz Molina.*** Área Química Orgánica.
- **"Estudio del proceso de coagulación y electrocoagulación de aguas residuales". *Carlos Jiménez Izquierdo.*** Dpto Ing. Química.
- **" Estudio teórico y experimental de la reacción troposférica de tetrahidropirano con átomos de cloro" *Antonio Ángel Ceacero Vega.*** Área Química Física.

12:00 -Viernes 16 de mayo 2008.

- **"La bajada de oxígeno modula la función neuronal" *Carlos Alberto Castillo Sarmiento.*** Área Bioquímica.
- **" Activación química de nanofibras de carbono" *Vicente Jiménez Cotillas.*** Dpto. Ing. Química.
- **" Selección de bacterias lácticas autóctonas para la elaboración de Queso Manchego". *Pedro Nieto Arribas.*** Área Tecnología Alimentos.

12:00 -Viernes 23 de mayo 2008

- **" Celdas de combustibles PEM de alta temperatura" *José Joaquín Linares León.*** Dpto. Ing. Química.
- **"Matemáticas en la convección del manto terrestre". *Francisco Pla Martos.*** Dpto. Matemáticas.
- **" Efecto combinado de la humedad de la pasta de aceituna y adición de talco sobre la composición y calidad del aceite de oliva virgen". *Antonio Inarejos García.*** Área Tecnología Alimentos.

12:00 - Jueves 29 de mayo 2008

- **"*Nuevos Catalizadores no metaloceno para polimerización de olefinas. Javier Romero Fernández de Marcos.*** Área Química Inorgánica.
- **"Miniaturización de sistemas analíticos electroforéticos". *Mónica Ávila Muñoz.*** Area Química Analítica.
- **"Aplicación de la Tecnología supercrítica a la extraccion de oleoresina de pimentón". *María Pilar Fernández Ronco.*** Área Ing. Química.

## Programación 6 de Junio 2008

(Salón de Actos de la Facultad de Ciencias Químicas)

9.00 Recepción de Participantes. Café.

9.30-9.45 Inauguración de la Jornada.

9.45-10.15 **"Nanotecnología. Síntesis y aplicaciones de nanopartículas encapsuladas en dendrímeros". *Dr. Francisco Javier Guerra Navarro.*** Universidad de Castilla La-Mancha.

10.15-10.45 **"Los extractos vegetales en la Alimentación funcional". *Dra. Esther de la Fuente García.*** Exxentia.

10.45-11.15 **"Evaluación ambiental de actividades contaminantes". *Ing. José Lizano Bermejo.*** Empresa Pública de Gestión Medioambiental de Castilla La-Mancha. GEACAM

11.15-11.45 Refresco

11.45-12.30 **"Levaduras: influencia de su metabolismo en los procesos de vinificación". *Dra. María Arévalo Villena.*** Universidad de Castilla La-Mancha.

12.30-13.00 **"I+D+i en CIDRA (alquimia soluciones ambientales)". *Dr. Javier Mena.*** Alquimia

13.00-13.30 **"*La Ciudad del Hidrógeno". Dr.* Pedro Carrión Lozoya.** AJUSA.

13.30-14.00 **"*¿Qué hace un ingeniero químico en la UCLM?. Dr. Rafael Camarillo Blas.*** Universidad de Castilla La-Mancha.

14.00-14.15 Charla-Coloquio **"Perspectivas para Jóvenes Investigadores". *Dr. Joaquín Calixto.*** Universidad de Castilla La-Mancha.

Clausura *II Jornadas de Ciencia Joven.*

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## ¿EN QUÉ CONSISTE?

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**Patrocinan:**

AQUICAM
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ACALCYTA
(Asociación Castellano-Manchega de Licenciados y Doctores en Ciencia y Tecnología de Alimentos)

Junta de Comunidades de Castilla-La Mancha

Consejería de Educación y Ciencia

ACMIQ
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ALAMBIQUE
(Asociación de antiguos alumnos y amigos de la Facultad)


**Más información:**
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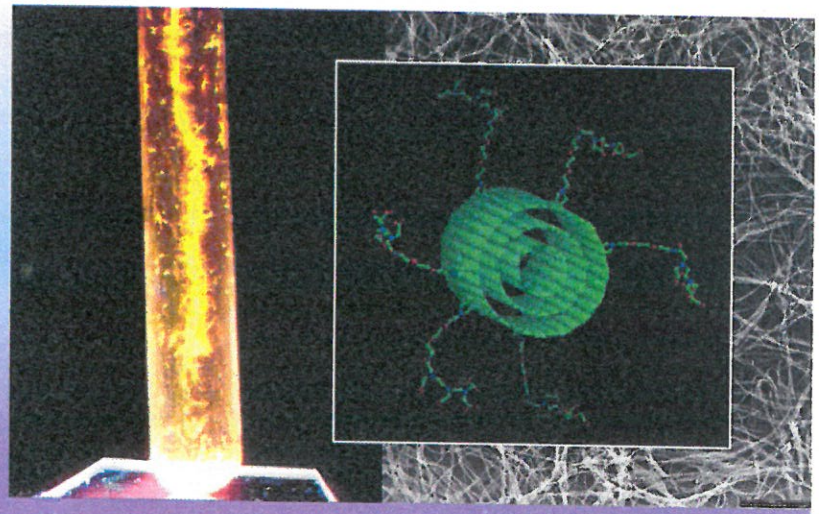
*Fco. Javier Guerra [FranciscoJ.Guerra@uclm.es]*
*Vicente Jiménez [Vicente.Jimenez@uclm.es]*
*Eva Sánchez-Palomo [Eva.Sanchez@uclm.es]*


**Facultad de Ciencias Químicas**
**Ciudad Real, de abril a junio de 2009**



# III Jornadas de CIENCIA JOVEN 2009

## Un foro de debate de jóvenes investigadores


**Comité Organizador:**
*Carlos Alonso Moreno, Francisco Javier Guerra Navarro, Vicente Jiménez Cotillas, Eva Sánchez-Palomo Lorenzo.*


Fotos cedidas por Carlos Romero Nieto y María Antonia Herrero Chamorro

## *Programación Abril-Mayo-Junio 2009*
### (Salón de Actos de la Facultad de Ciencias Químicas)

**11:30 -Jueves 30 de abril 2009. Inauguración *III Jornadas Ciencia Joven.***

- **"Promoción electroquímica de la catálisis".** *Carmen Jiménez Borja.* Dpto. Ing. Química.
- **"Estudio del potencial enológico de vinos de variedades minoritarias cultivadas en Castilla-La Mancha".** *Eva Gómez García-Carpintero.* Área Tecnología Alimentos.
- **"Nuevos complejos de Ru, Pd y Pt(II). Propiedades fotoquímicas y antitumorales".** *Pilar Carranza-Camacho.* Área Química Inorgánica.

**10:00 -Viernes 8 de mayo 2009.**

- **"Visita al CIDRA (Alquimia, Soluciones Ambientales)",** sita en Daimiel. Horario aprox. de 10 am a 3 pm.

**12:00 -Viernes 15 de mayo 2009.**

- **"Biorremediación de suelos contaminados con hidrocarburos".** *Elena Moliterni Merlo.* Dpto. Ing. Química.
- **"El agua en la química".** *Pablo Corrochano Díaz.* Área Química Física.
- **"Fluorescencia resuelta en el tiempo para la determinación de compuestos de interés farmacológico y medioambiental".** *Ignacio Sánchez-Ferrer Robles.* Área Química Analítica.

**12:00 - Viernes 22 de mayo 2009.**

- **"Caracterización química de la madera de roble y su importancia en el sector enológico ".** *María Elena Alañón Pardo.* Área Tecnología Alimentos.
- **"Biocombustibles. Cuantificación de emisiones no reguladas e implicaciones atmosféricas".** *Araceli Tapia Valle.* Área Química Física.
- **"El consumo de glutamato, aditivo potenciador del sabor, durante la lactancia altera los receptores de adenosina en cerebro materno y neonatal ".** *Antonio López Zapata.* Área Bioquímica.

**9:00 -Viernes 29 de mayo 2009.**

- **"Visita al CRDO La Mancha",** sito en Alcázar de San Juan. Horario aprox. de 9 am a 6 pm. Cata comentada en las instalaciones anteriores por la *Dra. Eva Sánchez-Palomo.* Área Tecnología Alimentos.

**12:00 -Viernes 5 de junio 2009.**

- **"El hidrógeno oculto de las bodegas: fermentación acidogénica de aguas residuales ".** *David Infantes Serrano.* Dpto. Ing. Química.
- **"La fusión hace el color. Sistemas tricíclicos luminiscentes".** *Carlos Romero Nieto.* Área Química Orgánica.
- **"Estudio sobre la calidad sensorial de la carne de ciervo cinegético faenado en distintas condiciones".** *María Cristina Utrilla Lucas.* Área Tecnología Alimentos".

## Jornada de Jóvenes Doctores-Investigadores.

**9:15-9:30 -Viernes 12 de junio 2009. Inauguración de la Jornada.**

**9.30-10.00 "Diseño de ingredientes hipoalergénicos mediante tratamientos de altas presiones y proteolisis ".** *Dra.* Rosa María Chicón Arias. Universidad de Castilla La-Mancha.

**10.00-10.30 "Funcionalización de enlaces C-H aromáticos mediante catalizadores del grupo XI".** *Dr.* Iván Rivilla de la Cruz. Universidad de Huelva.

**10.30-11.00 "Influencia de la cooperación empresarial, aprendizaje organizativo e innovación en los resultados empresariales".** Dr. *Jesús David Sánchez de Pablo Gonzáles del Campo.* Universidad de Castilla-La Mancha.

**11.00-11.30 Refresco**

**11.30-12.00 "Simulaciones teóricas y estudios experimentales de nuevos materiales conductores orgánicos".** *Dr. Andrés Garzón Ruiz.* Universidad de Jaén.

**12.00-12.30 "Una Ingeniero químico en el Centro Nacional de Experimentación en Tecnologías del hidrógeno y pilas de combustibles (CNETHPC) ".** *Ing. Nuria Rojas García-Pardo.* CNETHPC.

**12.30-13.20 Mesa Redonda: "Problemática del joven investigador"** *moderada por la Dra. Ester Vázquez Fernández-Pacheco.* Universidad de Castilla La-Mancha.

**Clausura *III Jornadas de Ciencia Joven.***

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Consejería de Educación y Ciencia

alquimia soluciones ambientales


**Más información:**
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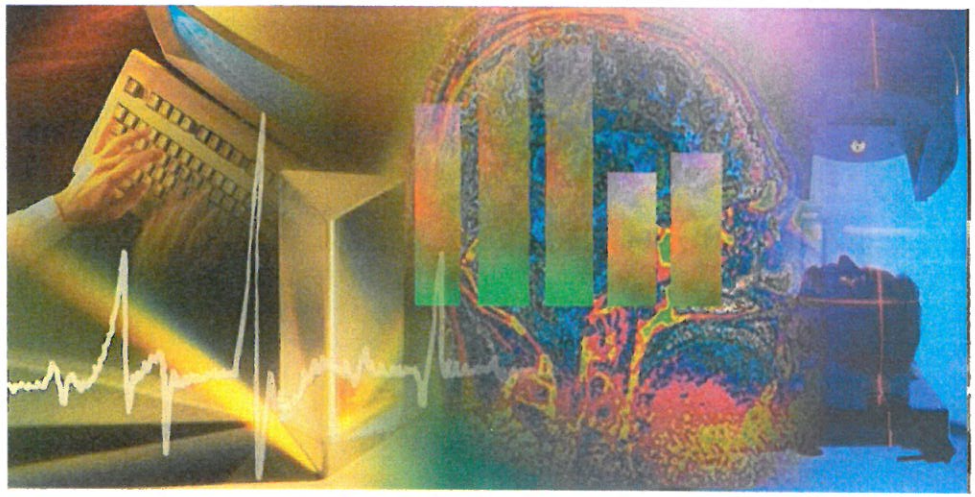
*Fco. Javier Guerra [FranciscoJ.Guerra@uclm.es]*
*Maria Cristina Utrilla [MariaC.Utrilla@uclm.es]*
*Leticia Isabel Cabezas [LeticiaI.Cabezas@uclm.es]*
*Mónica Ávila [Monica.Avila@uclm.es]*

Facultad de Ciencias Químicas
Ciudad Real, de abril a junio de 2010

# IV Jornadas de CIENCIA JOVEN 2010

## Un foro de debate de jóvenes investigadores


**Comité Organizador:**
*Maria Antonia Herrero Chamorro, Francisco Javier Guerra Navarro, Maria Cristina Utrilla Lucas , Leticia Isabel Cabezas Bermejo, Mónica Ávila Muñoz.*

## *Programación Abril-Mayo-Junio 2010*
### (Salón de Actos de la Facultad de Ciencias Químicas)

**11:30 -Viernes 30 de abril 2010. Inauguración *IV Jornadas Ciencia Joven***

- **"Espectroscopía de resonancia magnética nuclear y espectrometría de masas". *M. Victoria Gómez Almagro* y *Alberto Juan Ruiz.*** Área Q. Orgánica.
- **"*Cromatografía de exclusión por tamaños y su uso en tecnología de polímeros". Leticia Isabel Cabezas Bermejo.*** Dpto. Ingeniería Química.
- **"Soluciones Analíticas en laboratorios de la UCLM. Caso particular: laboratorio certificado de combustibles y biocombustibles". *José Ramón Ruiz González.*** Dpto. Ingeniería Química.

**12:00 -Viernes 7 de mayo 2010.**

- **"Selección de levaduras para vinificar en su entorno enológico". *Maria Jesús Ortiz Navarro.*** Área Tecnología Alimentos.
- **"Nanotecnología del carbono". *Noelia Rubio Carrero.*** Área Q. Orgánica.
- **"De los combustibles fósiles a los bioombustibles. Vuelta a la biomasa como fuente de energía". *Abraham Casas García-Minguillán.*** Dpto. Ingeniería Química.

**12:00 -Viernes 14 de mayo 2010.**

- **"Sistemas metaloceno en procesos catalíticos de polimerización de α-olefinas". *Rubén Gutiérrez González.*** Área Química Inorgánica.
- **"Nuevos sustitutos de los CFCs y su contribución al calentamiento global". *María Antiñolo Navas.*** Área Química Física.
- **"Determinación de sarafloxacino en muestras reales mediante quimioluminiscencia resuelta en el tiempo". *Fernando Martínez Ferreras.*** Área Química Analítica.

**11:30 - Viernes 21 de mayo 2010.**

- **"Productos elaborados con aceite de oliva virgen y otras materias vegetales por medio de co-procesado". Sergio González Gamallo.** Área Tecnología Alimentos.
- **"Diseño de nuevas entidades organometálicas de tierras raras como iniciadores en la síntesis de polímeros biodegradables". *Maria Isabel Márquez Segovia.*** Área Química Inorganica.
- **"Dispositivos electrónicos: hacia un futuro orgánico". *Cristina Cebrián Ávila.*** Área Química Orgánica.
- **"Nanocompounds interfacing on neurodegenerative diseases: a briefly overview". *Davide Giust.*** Área Bioquímica.

**10:00 -Viernes 28 de mayo 2010.**

- **"*Introducción a la cata de productos cinegéticos". María Cristina Utrilla Lucas.*** Área Tecnología Alimentos.

**12:00 -Viernes 4 de junio 2010.**

- **"Determinación de la madurez de la uva mediante análisis sensorial para la elavoración de vinos de calidad". *Manuel Ángel Gómez Gallego.*** Área Tecnología Alimentos.
- **"Leptina, obesida y diabetes tipo 2". *Aurora Salamanca Molina.*** Área Bioquímica.
- **"Análisis de la calidad del aire en Ciudad Real y Puertollano". *Florentina Villanueva García.*** Área Química Física.

## Viernes 11 de junio 2010:
## Jornada de Jóvenes Doctores-Investigadores.

**10:15-10:30 -Inauguración de la Jornada.**

**10.30-11.00 "Estudio de la deshidratación del mosto de uva por los métodos de atomización y liofilización".** *Dra. Carmen de Torres Sánchez-Simón.* Mostinsa, Ciudad Real.

**11.00-11.30 "Transición del mundo universitario al profesional. Experiencia personal de una Dr. en Química Inorgánica por la UCLM en una multinacional farmacéutica ".** *Dra.* María del Pilar Carranza Camacho. Departamento de I+D, SERVIER, Toledo.

**11.30-12.00 "De la química experimental a la computación química, ¿transición cuántica permitida?".** Dr. *Abel de Cózar Ruano.* Universidad del País Vasco-Euskal Herriko Unibertsitatea.

**12.00-14.00 Mesa Redonda: "Problemática del joven investigador"** *moderada por la Dra. María Antonia Herrero.* Universidad de Castilla La-Mancha.

Formarán parte de la mesa redonda:

- Dra. Lourdes Rodríguez Mayor (Alquimia Soluciones Ambientales)
- Dr. Enrique Díez Barra (Viceconsejero de Ciencia y Tecnología de la JCCM).
- Dr. Ángel Ríos Castro (Decano de la Facultad de Químicas de la UCLM).
- Dr Frédéric Sánchez (Responsable del departamento de I+D de Servier).
- Dra. Mairena Martín López (Vicerrectora del Campus de Ciudad Real).

**Clausura *IV Jornadas de Ciencia Joven.***

**CIENCIA JOVEN** es una iniciativa de la ***Facultad de Ciencias Químicas de Ciudad Real***, para la divulgación científica de trabajos desarrollados por ***Jóvenes Investigadores*** en la Comunidad de Castilla-La Mancha.

## ¿EN QUÉ CONSISTE?

Durante los meses de ***Abril, Mayo y Junio*** un grupo de ***jóvenes investigadores de la Facultad de Químicas*** darán a conocer mediante una serie de charlas divulgativas el trabajo de investigación que desarrollan dentro del campo de la Ciencia, mientras que en el mes de ***Junio*** será un grupo de ***jóvenes, doctorados por nuestra Universidad,*** así como algunos ***investigadores externos***, los que nos darán una visión más general sobre la investigación en España, tanto en instituciones públicas como en la empresa privada.

## ¿QUÉ PERSEGUIMOS?

- Poner en contacto a los jóvenes investigadores de nuestra Facultad.
- Dar a conocer las investigaciones que se están llevando a cabo en otras áreas.
- Acercar a los alumnos al mundo de la investigación.

## ¿A QUIÉN VA DIRIGIDO?

A los jóvenes investigadores de la Facultad y la región a través de la participación activa en las charlas.
A cualquier investigador de la Facultad cuya curiosidad científica no se limite sólo a su ámbito de trabajo.
A los alumnos de Químicas, Ingeniería Química y Tecnología de los Alimentos que quieran conocer mejor el mundo de la ciencia así como las distintas líneas de investigación que se siguen en nuestra Facultad.

**Patrocinan:**

Mervilab, S.A.
MATERIAL Y EQUIPOS DE VIDRIO DE LABORATORIO, S.A.

ACALCYTA
(Asociación Castellano-Manchega de Licenciados y Doctores en Ciencia y Tecnología de Alimentos)

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Junta de Comunidades de Castilla-La Mancha
Consejería de Educación y Ciencia

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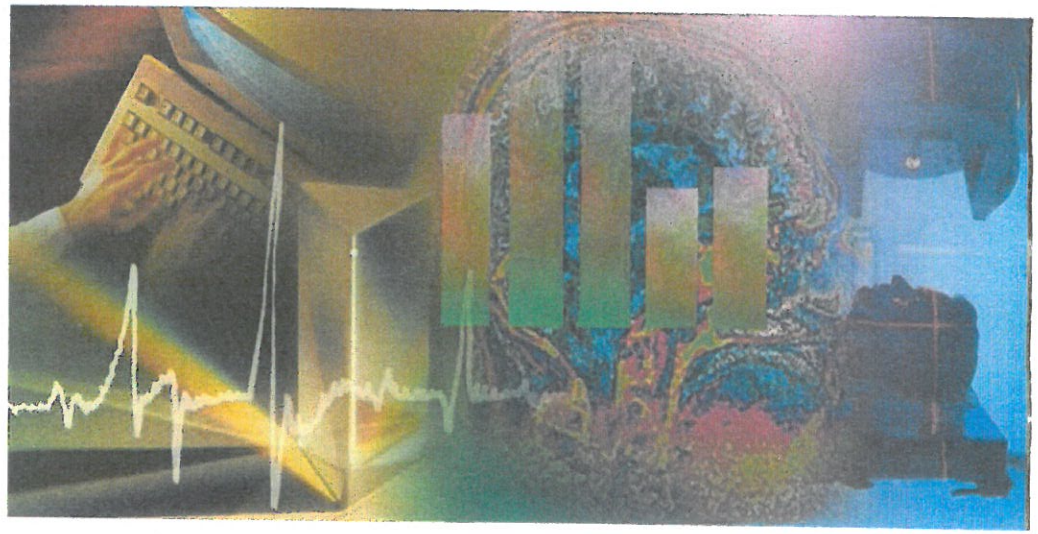
ACMIQ
(Asociación Castellano-Manchega de Ingenieros Químicos)

**Más información:**
*María Elena Alañón Pardo [MariaElena.Alanon@u clm.es]*
*María Antiñolo Navas [Maria.Antinolo@uclm.es]*
*Cristina Gútiérrez Muñoz [Cristina.Gutierrez@uclm.es]*
*Noelia Rubio Carrero [Noelia.Rubio@uclm.es]*



Facultad de Ciencias Químicas
Ciudad Real, de abril a junio de 2011

# V Jornadas de CIENCIA JOVEN 2011

## Un foro de debate de jóvenes investigadores

**Comité Organizador:**
*María Elena Alañón Pardo, María Antiñolo Navas, Cristina Gutiérrez Muñoz, Noelia Rubio Carrero*

# *Programación Abril-Mayo-Junio 2011*

## (Salón de Actos de la Facultad de Ciencias Químicas)

**11:30 –Miércoles 27 de abril 2011.** Inauguración *V Jornadas Ciencia Joven*

- **"*Mecanismos moleculares involucrados en la esquizofrenia*". Sara Díaz Sánchez.** Área Bioquímica.
- **"*Aplicación de la Resonancia Magnética Nuclear a la Química de Alimentos*". María Moreno Pérez.** Área Q. Orgánica.
- **"*La tecnología supercrítica en la fabricación de dispositivos biocompatibles para la liberación controlada de fármacos*". Leticia Isabel Cabezas Bermejo.** Dpto. Ingeniería Química.

**11:30 -Viernes 6 de mayo 2011.**

- **"*Estudio de la vida útil, valor nutricional y valorización de patatas congeladas sin prefritura*". Ana Belén Reina Fernandez.** Área Tecnología Alimentos.
- **"*Reactividad Troposférica de Furaldehídos con Radical Nitrato*". Inmaculada Colmenar González.** Área Q. Física.
- **"*Compuestos Dendriméricos con aplicaciones Biomédicas*". Ana Campo Rodrigo.** Área Q. Orgánica.
- **"*Alteraciones en los ciclos ayuno – alimentación con la edad y la obesidad*". Brenda Bárcena García.** Área Bioquímica.

**11:30 -Viernes 13 de mayo 2011.**

- **"*Grafeno: nanotecnología en la punta de un lápiz*". Verónica León.** Área Q. Orgánica.
- **"*Quiralidad Helicoidal Generada por Ligandos Heteroescorpionato en Complejos Organometálicos*". José Antonio Castro Osma.** Área Q. Inorgánica.
- **"*Estudio de propiedades biotecnológicas de levaduras procedentes de ecosistemas oleicos*". Sheila Romo Sanchéz.** Área Tecnología Alimentos.
- **"*Desarrollo de los retardantes de llama*". María Martínez Velencoso.** Dpto. Ingeniería Química

**11:30 -Viernes 20 de mayo 2011.**

- **"*El Hipotálamo Controla la Adiposidad. Papel de la Leptina.*". Alejandro Fernández Briones.** Área Bioquímica.
- **"*Influencia de los activadores metabólicos sobre la fermentación alcohólica*". Patricia Díaz Hellín Patiño.** Área Tecnología Alimentos.
- **"*Pérdidas Heterogéneas de Sustitutos de CFCs sobre Hielo*". María Elena Moreno Atahonero.** Área Q. Física.
- **"*Microencapsulación de agentes de extracción*". Ángela Alcázar Román.** Dpto. Ingeniería Química.

**10:00 -Viernes 27 de mayo 2011.**

- **"*Introducción a la cata de vinos*". Dra. Eva Schez-Palomo Lorenzo.** Área Tecnología Alimentos. Confirmar asistencia a: **mariaelena.alanon@uclm.es**

**Comienzo del plazo de inscripción: 13 de Abril de 2011.**

**Viernes 3 de junio 2011.**

**Jornada de Jóvenes Doctores-Investigadores.**

**10:15-10:30 -Inauguración de la Jornada.**

**10.30-11.00** "*Síntesis de PCM para su aplicación en prendas textiles*". **Dra. Mª Luz Sánchez Silva**

**11.00-11.30** "*La investigación en química forense, una actividad con impacto social*". **Dra. Carmen Ruiz García**

**11.30-12.00** "*El papel de los flavonoides en la relación dieta-cáncer*". **Dr. Sergio Gómez Alonso.**

**12.00-14.00 Mesa Redonda: "Ventajas competitivas del joven investigador"** *moderada por Dña. María Antiñolo Navas.* Universidad de Castilla La-Mancha.

Formarán parte de la mesa redonda:

- Dr. Enrique Díez Barra (Viceconsejero de Ciencia y Tecnología de la JCCM).
- Dr. Francisco José Quiles Flor (Vicerrector de Investigación de la UCLM).
- Dr. Francisco Javier Moreno Andújar. (Instituto de Fermentaciones Industriales del CSIC).
- Dra. Carolina Molero (Biocombustibles de Cuenca, S.A.).
- Dr. René Ignacio Rodríguez Curiel (Director técnico en la empresa Kylolab S.L.).

Clausura *V Jornadas de Ciencia Joven*

**CIENCIA JOVEN** es una iniciativa de la ***Facultad de Ciencias y Tecnologías Químicas de Ciudad Real***, para la divulgación científica de trabajos desarrollados por ***Jóvenes Investigadores*** en la Comunidad de Castilla-La Mancha.

## ¿EN QUÉ CONSISTE?

Durante los meses de ***Mayo y Junio*** un grupo de ***jóvenes investigadores y doctores de la Facultad de Ciencias y Tecnologías Químicas*** darán a conocer mediante una serie de charlas divulgativas el trabajo de investigación que desarrollan dentro del campo de la Ciencia, así como algunos ***investigadores externos***, los que nos darán una visión más general sobre la investigación en España, tanto en instituciones públicas como en la empresa privada.

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**Patrocinan:**

Merilab, S.A.
MATERIAL Y EQUIPOS DE VIDRIO DE LABORATORIO, S.A.

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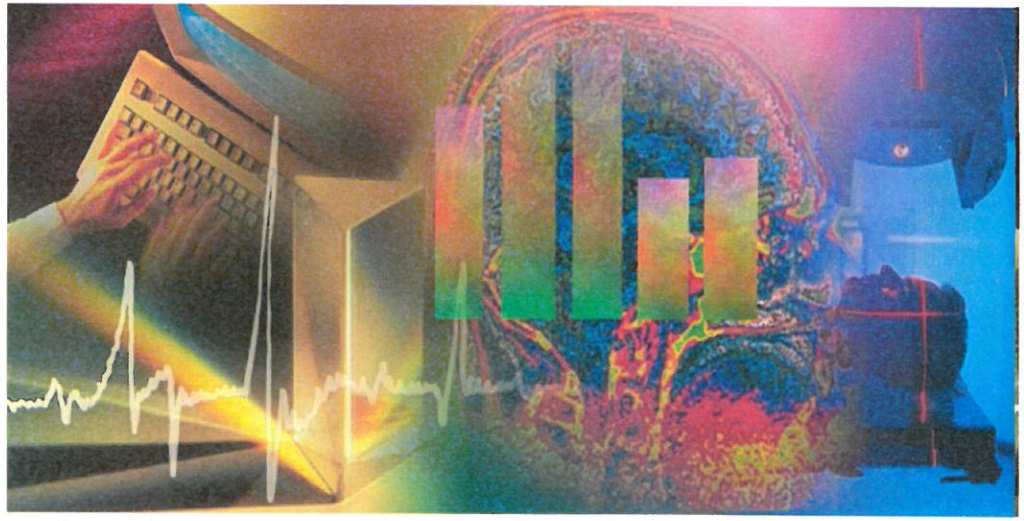
ST Castilla La Mancha
Real Sociedad Española de Química

**ACMIQ**
(Asociación Castellano-Manchega de Ingenieros Químicos)


**Más información:**
*José Antonio Castro Osma [JoseAntonio.Castro@uclm.es]*
*Lucía Isabel Castro Vázquez [LuciaIsabel.Castro@uclm.es]*
*María Victoria Gómez Almagro [MariaVictoria.Gomez@uclm.es]*
*Cristina Gutiérrez Muñoz [Cristina.Gutierrez@uclm.es]*

**Facultad de Ciencias y Tecnologías Químicas**
**Sección Territorial de Castilla-La Mancha de la RSEQ**

# VI Jornadas de CIENCIA JOVEN 2012

## Encuentro de jóvenes investigadores

UCLM
UNIVERSIDAD DE CASTILLA-LA MANCHA

FACULTAD DE CIENCIAS Y TECNOLOGÍAS QUÍMICAS
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UCLM

ST Castilla La Mancha
Real Sociedad Española de Química


**Comité Organizador:**
*José Antonio Castro Osma, Lucía Isabel Castro Vázquez, María Victoria Gómez Almagro, Cristina Gutiérrez Muñoz*

## *Programación Mayo-Junio 2012*

**(Salón de Actos de la Facultad de Ciencias y Tecnologías Químicas)**

**11:30-14:00 –Viernes 18 de mayo 2012. Inauguración *VI Jornadas Ciencia Joven***

- ***"Efecto de la cafeína en el cerebro"*. José Ramón Muñoz.** Área Bioquímica.
- ***"Del agua al hidrógeno: Combustible verde con la ayuda del sol"*. Javier Torres.** Área Q. Inorgánica.
- ***"Caracterización de cepas de levaduras no-Saccharomyces procedentes de destilerías"*. María Maldonado.** Área Tecnología Alimentos.
- ***"Regeneración electroquímica de aguas residuales depuradas"*. Salvador Cotillas.** Dpto. Ingeniería Química.
- ***"Hacia la nueva generación de dispositivos electrónicos"*. Dr. Antonio Esaú del Río.** Área Q. Orgánica.

**12:00-14:00 –Miércoles 23 de mayo 2012.**

- ***"Nuevos materiales porosos: MOF. Diseño de su síntesis y aplicaciones"*. Gema Durá.** Área Q. Inorgánica.
- ***"Química en flujo, una nueva alternativa"*. Antonio M Rodríguez .** Área Q. Orgánica.
- ***"La radiación microondas, un método de calefacción sostenible"*. José Ramón Ramírez.** Área Q. Orgánica
- ***"Innovaciones tecnológicas en la elaboración de vinos blancos de Castilla La-Mancha"*. Rodrigo Alonso.** Área Tecnología de los Alimentos.
- ***"Desarrollo y validación de nuevos procesos analíticos que incorporan nanomateriales"*. Dra. Mª Jesús Lerma .** Área Q. Analítica.

**12:00-14:00 –Martes 5 de junio 2012.**

- ***"Efectos del tratamiento intracerebroventricular con leptina sobre el metabolismo de hígado de rata"*. Virginia López.** Área Bioquímica.
- ***"Promoción electroquímica para la producción de hidrógeno a partir de alcoholes"*. Jesús González.** Dpto. Ingeniería Química.
- ***"Determinación de antioxidantes naturales en alimentos representativos de la dieta mediterránea"*. Ana Mª Bueno.** Área Q. Analítica.
- ***"La leptina controla la acción de la insulina en el tejido adiposo"*. Alejandro Fernández.** Área Bioquímica.
- ***"Low temperature kinetic studies relevant to planetary atmospheres"*. Dr. Thomas Townsend.** Área Q. Física.

**Viernes 22 de junio 2012.**

**10:00-11:30**

- ***"Alteraciones bioquímicas en el corazón de ratas con el envejecimiento y la resistencia a la insulina"*. Cristina Mora Herrera.** Área Bioquímica.
- ***"Nanoestructuras de carbono en la lucha contra el cáncer"*. Mª Isabel Lucio.** Área Q. Orgánica.
- ***"Eliminación de contaminantes persistentes de aguas residuales mediante oxidación electroquímica"*. Mª José Martín .** Dpto. Ingeniería Química.
- ***"Obtención de levaduras vínicas hibridas optimizadas para condiciones difíciles de fermentación"*. Dra. Mónica Fernández.** Área Tecnología Alimentos.

**11:30-12:00-Café.**

**12:30-14:00- Mesa Redonda: "Ventajas competitivas del joven investigador"**

Por confirmar los asistentes.

**Clausura *VI Jornadas de Ciencia Joven***

**PONENTES PRINCIPALES:**

**Nazario Martín:** Es Catedrático de Química Orgánica en la Facultad de Químicas de la Universidad Complutense de Madrid, dónde lidera el grupo *Organic Molecular Materials*. Es uno de los investigadores más influyentes en el panorama internacional en temas relacionados con los nanomateriales de carbono como fullerenos, nanotubos o grafeno.

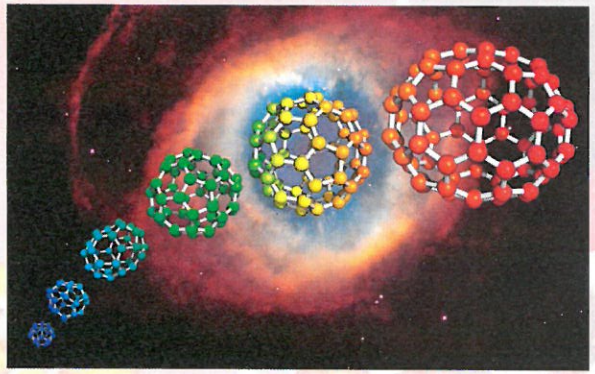
**Elena Ibañez:** Es Dra. en Química Analítica por la Universidad Autónoma de Madrid. Actualmente es Profesora de Investigación en el Instituto de Investigación de Ciencias de la Alimentación (CIAL). Su relevancia queda confirmada con sus 10 capítulos en libros, 10 patentes y más de 150 publicaciones científicas.

**Conrado López:** Es Dr. en Química Industrial Complutense de Madrid y desde 1990 es Director Técnico de la Planta Química de Laboratorios Servier en Toledo. Es especialista en Gestión de Calidad y Medioambiente, y como tal ha colaborado como profesor asociado con la Universidad Rey Juan Carlos y con la Universidad de Castilla-La Mancha. Ha realizado y dirigido veinte proyectos de I + D de vías de síntesis de moléculas del Grupo Servier, todas ellas patentadas entre 1987 y 2012.

**PATROCINADORES:**

**Para más Info:**

Daniel Iglesias Asperilla: d.iglesias.asperilla@gmail.com



# VII SIMPOSIO CIENCIA JOVEN

*Salón de Actos de la Facultad de Ciencias y Tenologías Químicas*

*Jueves 23 y Viernes 24 de Mayo*

CRÉDITO DE LIBRE CONFIGURACIÓN: La Universidad de Castilla-La Mancha concede 1 crédito de libre elección

DIPLOMA DE ASISTENCIA A TODOS LOS PARTICIPANTES

Organización:

***Lucía Castro Vázquez "Ciencia y Tecnología de Alimentos"***

***Daniel Iglesias Asperilla "Química orgánica"***

***María Carmen Carrión Núñez "Química inorgánica"***

***Carmen Jiménez Borja "Ingeniería química"***

***Ángel Ríos Castro, Decano de la Facultad***

***Julián Rodríguez López "RSEQ"***

## Jueves 23 de Mayo

9:00- Entrega de la documentación

9:30- Inauguración por el Rector Mgfco. de la Universidad de Castilla-La Mancha

10:00- Conferencia Invitada: **Dr. Conrado López** (Director de Planta Servier, Toledo), *"Investigación y desarrollo de principios activos de nuevos medicamentos en la industria química".*

10:45- Sesión de Presentaciónes I

- *"Caracterización tecnológica de cepas bacterianas asiladas de Quesos de Brasil"*, **Felipe Noel**, Tecnología de Alimentos.
- *"Complejos de Lantano para la Síntesis de Polímeros Biodegradables"*, **Javier Martínez**. Química Inorgánica.

11:30- Café

12:00- Conferencia Invitada: **Dra. Elena Ibañez** (Profesora de Investigación del Instituto de Invesitagación de Ciencias de la Alimentación CSIC-AUM): *"Nuevas aproximaciones ecológicas a la alimentómica".*

12:45 Sesión de Presentaciones II

- *"Celdas de combustible microbianas: bacterias que generan electricidad a partir de residuos"*, **Araceli González**. Ingeriería Química.
- "Espectroscopía de Resonancia Magnética Nuclear: Una herramienta multidisciplinar" **Dra. María Victoria Gómez.** Química Orgánica.
- *"Nanociencia y nanotecnología analíticas. Empleo de nanopartículas de oro como herramientas analíticas "*, **Mar Gonzalez**. Química Analítica.

14:00-16:00 Descanso para la comida

16:00- Presentación de la Sección Territorial de la Real Sociedad Española de Química, **Dr. Julián Rodríguez López**

16:15- Sesión de Presentaciones III

- *"Mecanismos de resistencia a insulina. ¿Posibles dianas terapéuticas?"*. **Cristina Pintado**. Bioquímica.
- *"Optimización de redes de intercambio de calor"*. **Mauricio Altamirano**. Ingeniería Química.

17:00- Café

17:30- Acto de Entrega de Premios de la Olimpiada de Química 2013, presidido por la Vicerrectora de Estudiantes de la UCLM

18:00- Sesión de Presentaciones IV

- *"Glicólisis de espumas flexibles a poliuretanos"*, **Diego Simón**. Ingenieria Química.
- *"Homogeneización de metamateriales"*, **Helia Serrano**. Matemáticas.
- *"Visión de un Doctor en la Empresa Privada: Exide Technologies"*. **Dr. Vicente Jiménez**.

**INSCRIPCIONES:**
**Decanato de la Facultad de Ciencias y Tenologías Químicas (Edificio San Alberto Magno)**
**Fecha límite: 17 de Mayo**

## Viernes 24 de Mayo

9:30- Sesión de Presentaciones V

- *"Expresión génica en condiciones óptimas y de enlentecimiento fermentativo en S. Cerevisae rehidratada con activadores metabólicos"*, **Patricia Díaz**, Tecnología de Alimentos.
- *"Presencia de taninos elágicos en vinos tintos de crianza"*, **María Navarro**. Tecnología de alimentos.
- *"Captura de $CO_2$ con microalgas"*, **Rosa María Sánchez**. Ingeniería Química.

10:45- Café

11:15- Conferencia Invitada: **Dr. Nazario Martín** (Catedrático de Química Orgánica de la Universidad Complutense de Madrid): *"Química Supramolecular de nanoestructuras de carbono"*

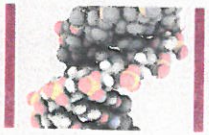
12:00- Sesión de Presentaciones VI

- *"Proceso de desarrollo y descubrimiento de fármacos en enfermedades neurodegenerativas"*, **Ana María García.** Química Médica.
- *"Aldehídos insaturados en la atmósfera: tiempos de vida y su importancia en la generación de ozono troposférico"* **Inmaculada Colmenar.** Química Física

12:45- Mesa Redonda

14:00- Clausura del acto.

REVISTA MOLÉCULA



**PONENTES PRINCIPALES:**

**Francisco Jiménez Colmenero:** Es profesor de Investigación del Instituto de Ciencia y Tecnología de Alimentos y Nutrición (ICTAN-CSIC). Forma parte del Dpto de Productos, y es responsable del grupo de carne y productos cárnicos (CARPROCAR). Desempeña distintas actividades científicas de carácter tanto básica orientada como de aplicación tecnológica, encaminadas a la mejora de la calidad y seguridad de la carne y sus derivados, así como al desarrollo de productos cárnicos más saludables.

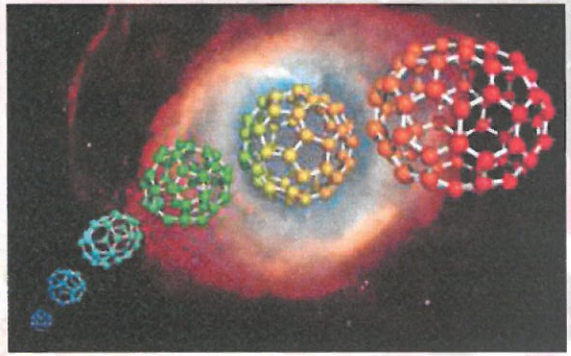
**Jesús García Gómez:** Es R&D Engineer en REPSOL y Profesor Asociado en el Departamento de Ingeniería Química de la Universidad de Castilla la Mancha. Ha desarrollado toda su actividad profesional en REPSOL ocupando también los puestos de Research Enginner (2003-2008) y Process Engineer (2008-2012).

**Jesús Alberto Escarpa Miguel:** Es Profesor Titular de Química Analítica de la Universidad de Alcalá desde 2003. En 2003 recibió el premio de Jóvenes Investigadores de la Universidad de Alcalá y creó el grupo de Miniaturización y nanotecnología analíticas (MINYNANOTECH) que dirige en la actualidad. Sus principales líneas de investigación son el diseño y el desarrollo de estrategias analíticas empleando tecnologías "lab-on-a-chip" y nanomateriales.

**PATROCINADORES:**

**Para más Información:**
**Javier Martínez Martínez:** Javier.mmartinez@uclm.es

**Inscripciones: Remitir boletín a**
Monica.Fernandez@uclm.es
**o entregar en la secretaría de la Facultad**



## VIII SIMPOSIO CIENCIA JOVEN 2014

*Salón de Actos de la*

***Facultad de Ciencias y Tenologías Químicas***

*Jueves 22 y Viernes 23 de Mayo de 2014*

CRÉDITO DE LIBRE CONFIGURACIÓN: La Universidad de Castilla-La Mancha concede 1 crédito de libre elección

DIPLOMA DE ASISTENCIA A TODOS LOS PARTICIPANTES

Organización:

***Ángel Ríos Castro, Decano de la Facultad***

***Mónica Fernández González "Ciencia y Tecnología de Alimentos"***

***M. Carmen Carrión Núñez de Arenas "Química inorgánica"***

***Javier Martínez Martínez "Química Inorgánica"***

***Covadonga Lucas-Torres Pérez "Química orgánica"***

***Ana Raquel de la Osa Puebla "Ingeniería química"***

***Julián Rodríguez López "RSEQ"***

## Jueves 22 de Mayo 2014

9:00- Entrega de la documentación

9:30- Inauguración por el Rector Mgfco. de la Universidad de Castilla-La Mancha **Dr. D. Miguel Ángel Collado Yurrita**

10:00- Conferencia Invitada: **Dr. Francisco Jiménez Colmenero** (Profesor de Investigación del Instituto de Ciencia y Tecnología de Alimentos y Nutrición (ICTAN-CSIC)), *"Alimentos cárnicos funcionales: estrategias de desarrollo y evaluación de sus propiedades saludables"*

10:45- Sesión de Presentaciónes I

- *"Estructuras supramoleculares basadas en derivados de 4-aril-4H-1,2,4-triazol como guía de onda óptica".* **Ivan Torres**. *Química Orgánica*
- *"Calidad Integral de la Leche de Oveja Manchega en relación con el Sistema Productivo de la Ganadería"* **Lorena Jiménez.** *Tecnología de Alimentos*

11:30- Café

12:00- Sesión de Presentaciones II

- *"Recuperación, caracterización y conservación de variedades de vid(Vitis vinífera L.) minoritarias de Castilla la Mancha"* **Dra. Adela Mena**. *Instituto de la vid y el vino de CLM*
- *"Influencia de las características edáficas en la movilidad del cadmio, plomo y cinc en distintos suelos"* **Carmen Ruiz**. *Geoquímica*

12:45 Sesión de Presentaciones III

- *"Secado por aspersión de zumo de uva: microencapsulación de antocianos"* **Poliana Moser**. *Tecnología de Alimentos*
- *"Bioelectrorremediación de suelos contaminados con diesel"* **Esperanza Mena.** *Ingeniería Química*
- *"Valorización energética de residuos orgánicos de origen animal"* **María Fernández.** *Ingeniería Química*

14:00-16:00 Descanso para la comida

16:00- Presentación de la Sección Territorial de la Real Sociedad Española de Química, **Dr. Julián Rodríguez López**

16:15- Conferencia Invitada: **Dr. Jesús García Gómez** (REPSOL), *"La tecnología en REPSOL"*

17:00- Receso

17:30- Conferencia Invitada: **Dr. Jesus Alberto Escarpa Miguel** (Profesor de Química Analítica de la UHA), *"Microchips analíticos con nanohilos de cobre para el diagnóstico precoz de galactosemia en neonatos"*

18:15- Sesión de Presentaciones IV

- *"Uva BRS-Violeta y Jambolán (Syzygium cumini L.): Estudio de los cambios químicos y bioquímicos en la producción de zumo deshidratado mediante secado en lecho de espuma"* **Iasnania Maria de Carvalho**. *Tecnología de Alimentos*
- *"Celdas de Combustible Microbiológicas para el Tratamiento de Aguas Residuales"* **Sara Mateo.** *Ingeniería Química*
- *"Producción de $H_2$ puro mediante electro-reformado de moléculas de origen biomásico"* **Ana Belén Calcerrada.** *Ingeniería Química*
- *"Mecanismos termoconvectivos para la formación de torbellinos de polvo"* **Damián Castaño.** Matemáticas

## Viernes 23 de Mayo 2014

9:30- Sesión de Presentaciones V

- *"La restricción calórica incrementa los efectos anti-obesidad de la leptina central en ratas Wistar de mediana edad"* ***Virginia Gomez***, Bioquímica.
- "New stimuli responsive hydrogels based on graphene" **Cristina Martín.** *Química Orgánica*
- *"Marcadores de vulnerabilidad y respuesta a la cirugía bariátrica en la obesidad mórbida"* **José Ramón Muñoz.** *Hospital General Universitario de Ciudad Real*
- *"CE-ELSD coupling for characterization and separation of gold nanoparticles"* **Mohamed Bouri.** *Química Analítica*

10:45- Café

11:15- Sesión de presentaciones VI

- *"Quantum Dots de CdSe/ZnS modificados con ß-ciclodextrina como sensor para la vanillina"* **Gema Durán.** *Química Analítica*
- *"Hidrogenación de cetonas e iminas a partir de complejos areno de rutenio en medio acuoso"* **Margarita Ruiz.** *Química Inorgánica*

12:00- Contribuciones científicas de los investigadores del Programa INCRECYT (Instituto de Recursos Humanos para la Ciencia y la Tecnología)

- **Dr. Sergio Gómez Alonso.** Compuestos Bioactivos
- **Dra. Mª del Carmen Carrión Núñez De Arenas.** Química Organometálica.
- **Dra. Mónica Fernández González.** Microbiología Enológica
- **Dra. Mª Victoria Gómez Almagro.** Miniaturización en Resonancia Magnética Nuclear.
- **Dra. Florentina Villanueva García.** Contaminación Atmosférica.
- **Dr. Mohammed Zougagh.** Simplificación y miniaturización de los procesos analíticos.

12:45- **Mesa Redonda** , presidida por el Vicerrector de Investigación de la UCLM **Dr. D. José Julián Garde López-Brea** y con la participación del Director General de Universidades de la JCCM, **D. José Manuel Velasco Retamosa**, el Decano de la Facultad, **D. Ángel Ríos Castro**, el Presidente de la Sección Territorial de la RSEQ, **D. Julián Rodríguez López**, y el Director del IRICA, **D. Félix A. Jalón Sótes.**

14:00- Clausura del acto.

## PONENTES INVITADOS:

**Miguel Valcárcel Cases:** Es Catedrático en la Universidad de Córdoba desde el año 1976. Ha sido Presidente de la División de Química Analítica de la Federación Europea de Sociedades Químicas y Coordinador de Química de la ANEP. Experto en el 6º Programa Marco de la Unión Europea. Académico Numerario de la Real Academia de Ciencias Exactas, Físicas y Naturales.

**Juan Ignacio Cirac Sasturain:** Ha sido profesor titular de la Universidad de Castilla-La Mancha en el Departamento de Física Aplicada. Desde 2001 es Director de la División Teórica del Instituto Max-Planck de Óptica Cuántica (Max-Planck-Institut für Quantenoptik) en Garching. Premio Wolf en Física y Príncipe de Asturias de Investigación Científica.

**Ascensión Marcos Sánchez:** Es Directora del Grupo de Inmunonutrición en el Instituto de Ciencia y Tecnología de los Alimentos y Nutrición del CSIC. Preside la *Federation of European Nutrition Societies* y la *International Society of Inmunonutrition*. En el 2014 fue galardonada con el premio Instituto Danone a la trayectoria científica.

**José Manuel Pingarrón Carrazón:** Profesor en la Universidad Complutense de Madrid y es miembro del equipo de gestión del Plan Nacional de Proyectos de Investigación, subprograma Química Básica, del MINECO. Miembro de los Comités de Química Analítica de la IUPAC y de la *European Association for Chemical and Molecular Sciences*.

**Miguel Ángel Gilarranz Redondo:** Profesor de la Universidad Autónoma de Madrid. Colaborador de MINECO en la gestión del Plan Estatal de I+D+i y en el programa internacional de programación conjunta Water JPI. Miembro del comité de Medio Ambiente del 7º Programa Marco.

## PATROCINADORES:

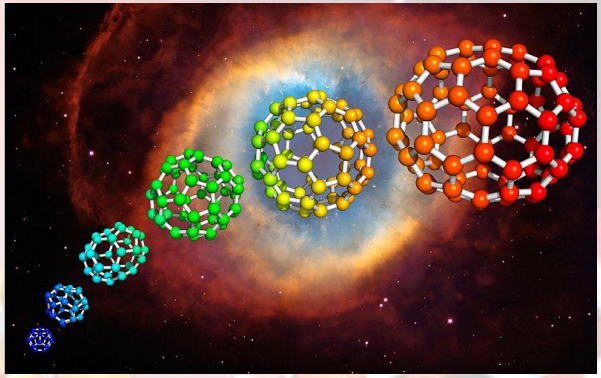
## Para más Información:

**Javier Martínez Martínez:** Javier.mmartinez@uclm.es

## Inscripciones:

Remitir boletín a Monica.Fernandez@uclm.es

**o entregar en la secretaría de la Facultad**



# IX SIMPOSIO CIENCIA JOVEN 2015

*Salón de Actos de la*

***Facultad de Ciencias y Tecnologías Químicas***

***Jueves 21 y Viernes 22 de Mayo de 2015***

1 CRÉDITO DE LIBRE CONFIGURACIÓN por la Universidad de Castilla-La Mancha

***Incluido como actividad formativa en Programas de Doctorado de la UCLM***

DIPLOMA DE ASISTENCIA A TODOS LOS PARTICIPANTES

## Organización:

***Ángel Ríos Castro, Decano de la Facultad***
***Mónica Fernández González "Ciencia y Tecnología de los Alimentos"***
***Virginia Moreno García "Química Analítica"***
***Javier Martínez Martínez "Química Inorgánica"***
***Almudena Lorente Diezma "Química Orgánica"***
***Ana Raquel de la Osa Puebla "Ingeniería Química"***
***Julián Rodríguez López "RSEQ"***

## Jueves 21 de Mayo 2015

9:00- Entrega de la documentación

9:30- Inauguración por el Rector Mgfco. de la Universidad de Castilla-La Mancha **D. Miguel Ángel Collado Yurrita**

10:00- Conferencia Invitada: **D. Miguel Valcárcel Cases**, *"Una apuesta por la interdisciplinariedad: Premio Nobel de Química 2014. Microscopía de fluorescencia de alta resolución (Nanoscopio)".*

10:45- **Sesión de Presentaciones I**

- *"Aplicaciones del anillo de triazol en electrónica orgánica".* **Iván Torres**. *Química Orgánica*
- *"Linking electroactive units to carbon no structures. Synthesis and properties of DWCNT-Phthalocyanine hybrids"* **Luis Miguel Arellano.** *Química Analítica.*
- *"Síntesis de aerogeles poliméricos dopados con nanomateriales carbonosos e influencia de las condiciones de operación en su preparación"* **Carolina Simón.** *Ingeniería Química.*

11:30- Café

12:00- Conferencia Invitada: **D. Juan Ignacio Cirac Sasturain** *"Mi trayectoria investigadora desde los orígenes hasta ser el director de la División Teórica del Instituto Max-Plank de Óptica Cuántica"*

12:45- **Sesión de Presentaciones II**

- "Fluorescent chemosensor for pyridine base on N-doped carbon dots" **Carlos Abellán**. *Química Analítica*
- *"Síntesis de metanol a partir de $CO_2$ y $H_2O$ mediante electrocatálisis y catálisis convencional"* **Javier Díez.** *Ingeniería Química*
- *"Complejos heteroescorpionato de aluminio para la síntesis de carbonatos cíclicos"* **Miguel Angel Gaona.** *Química Inorgánica*
- *"Diseño de un protocolo experimental para el aislamiento de peroxisomas y mitocondrias a partir de tejidos para el estudio del estrés oxidativo en diferentes condiciones fisiológicas".* **Jaime Gabriel Martín-Albo.** *Bioquímica*

14:00-16:00 Descanso para la comida

16:00- **Sesión de Presentaciones III**

- *"Magnetic multiwalled carbon nanotube silica composites for solid phase extraction of macrocyclic lactone mycotoxins in food samples prior to liquid Chromatography Analysis"* **Virginia Moreno**. *Química Analítica*
- *"Síntesis de grafeno mediante deposición química en fase vapor usando diferentes metales como catalizadores"* **Mª del Prado Lavín.** *Ingeniería Química.*
- "Quantum dots de grafeno, coloreando la nanotecnología" **Ana Martin.** *Química Orgánica*

16:45- Presentación de la Sección Territorial de la Real Sociedad Española de Química, **Dr. Julián Rodríguez López**

17:00- Receso

17-30- Conferencia Invitada: **Dña. Ascensión Marcos Sánchez**, *"Una epidemia actual: La obesidad"*

18:15- **Sesión de Presentaciones IV**

- "Efecto de la dosis de (-) epicatequina en la prevención de enfermedades cardiovasculares" **Mª Elena Alañón**. *Tecnología de Alimentos.*
- *"Nanopartículas de sílice en alimentos"* **Carlos Adelantado.** *Química Analítica*
- *"¿Residuo o energía? Conversión del bagazo cervecero en precursores de biocombustibles"* **Almudena Lorente.** *Química Orgánica.*

19:00- **Sesion de presentaciones V**

- *"Development of anion exchange membranes for electro-desinfection"* **Alexandra Raschitor.** *Ingeniería Química*
- *"Degradación de hidrofluorolefinas (HFOs) en la troposfera: Reacción de radicales OH"* **Sergio González.** *Química Física*
- *"Papel del resveratrol como agente antitumoral"* **Alejandro Sánchez.** *Bioquímica*
- *"Síntesis y caracterización de nuevos catalizadores Ni (0) con ligandos tipo base de Schiff derivadas de 3 amino-pirazol"* **Jaime Gabriel Martínez.** *Química Inorgánica*

## Viernes 22 de Mayo 2015

9:30- **Sesión de Presentaciones VI**

- *"Magnetic cotton composites for solid phase extraction of Sudan dyes in food samples prior to capillary liquid chromatography analysis"* ***Yassine Benthair and Said El Marhoum.*** *Química Analítica.*
- "Diseño de un protocolo experimental para el aislamiento de peroxisomas y mitocondrias a partir de tejidos para el estudio del estrés oxidativo en diferentes condiciones fisiológicas. **Gabriel Jaime Martin-Albo.** *Bioquímica*
- *"Síntesis de derivados imino triazinas. Propiedades ópticas"* **Diego Rodríguez.** *Química Orgánica*
- *"Mineralización de soluciones de carbamazepina mediante oxidación avanzada con persulfato activado"* **Antonio José Expósito.** *Ingeniería Química*

10:45- Café

11:15- **Sesión de presentaciones VII**

- *"Determinación de compuestos anticancerígenos en fluidos biológicos"* **Isabel Lizcano.** *Química Analítica*
- *"Preparación de compuestos de platino como nuevos fármacos anticancerígenos. Mejores vías de administración y menores efectos secundarios"* **Jorge Leal.** *Química Inorgánica*
- *"Producción de electricidad a partir de energía solar con celdas fotomicrobiológicas"* **Yeray Asensio.** *Ingeniería Química.*
- *"Computacional chemistry: a new way of designing and understanding Organic Chemistry"* **Raúl Martin.** *Química Orgánica.*
- *"Materiales termorreguladores para la mejora del rendimiento energético de edificios"* **Ángel Serrano.** *Ingeniería Química*

12:45- **Mesa Redonda**, presidida por el Vicerrector de Investigación de la UCLM **D. José Julián Garde López-Brea** y con la participación de **D. José Manuel Pingarrón Carrazón**, miembro del equipo de gestión de Proyectos de Investigación del MINECO, subprograma de Química Básica (evaluación y financiación de proyectos de investigación nacionales); **D. Miguel A. Gilarranz Redondo** colaborador MINECO (proyectos europeos e internacionales); **D. Ángel Ríos Castro**, Decano de la Facultad.

14:00- **Clausura del acto.**

- *"Formation and evolution of thermoconvective vortices: application to atmospheric phenomena"*. **Damián Castaño Torrijos.** Matemáticas.
- *"Adrenoceptors Subcellular Levels in Wistar Rats: Effects of Central Infusion of Leptin and Caloric Restriction"*. **Lorena Mazueca Fernández- Pacheco.** *Bioquímica.*
- *"Study of antimicrobial activity of several yeast species isolated from food against bacterial pathogens"*. **Heidy Marcela Gómez Gaona.** *Tecnología de Alimentos.*

**Viernes 10 de Junio 2016**

9:30- Sesión de Presentaciones VIII

- *"Morphology separation of vinyl-terminated gold nanoparticles (AuNPs) by capillary electrophoresis-diode array detector (CE-DAD)"*. **Carlos Adelantado Sánchez.** *Química Analítica.*
- *"Helichal chiral aluminum complexes for the synthesis of poly- and cyclic carbonates"*. **Miguel Ángel Gaona Fernández**. Química Inorgánica.
- "Analyzing the etiology of metabolic disorders by means of Lipidomic Analysis". **Virginia López Gómez- Carreño**. *Bioquímica.*
- *"Electrochemical synthesis of peroxyacetic acid using conductive diamond electrodes"*. **Inmaculada Moraleda Nuñez**. *Ingeniería Química.*

10:30- Café

11:00- Sesión de presentaciones IX

- *"Decoration of multiwall-carbon nanotubes with metal nanoparticles in supercritical carbon dioxide: a novel approach for the modification of screen-printed carbon electrodes"*. **Virginia Moreno García.** *Química Analítica.*
- *"Effects of Febrile Seizures on Adenosine Receptors in Neonates"*. **María Crespo Gutiérrez**. *Bioquímica.*
- *"Domain decomposition numerical methods applied to Rayleigh-Bénard problems"*. **Miriam Ruiz Ferrández.** Matemáticas**.**
- *"Microwave heating for the conversion of agro-industrial waste into valuable chemicals and materials"*. **Covadonga Lucas Torres**. *Química Orgánica.*

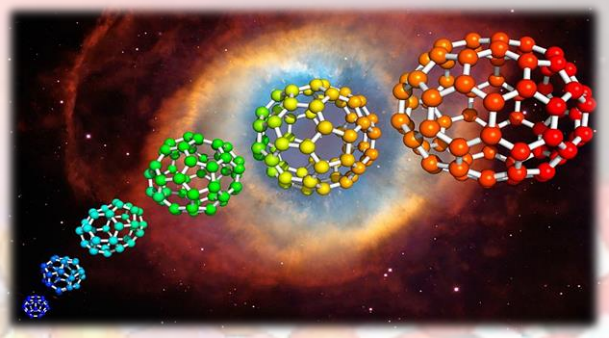
12:00-**Conferencia Invitada: Dra. Mª Raquel Mateos Briz** (Dpto. Metabolismo y Nutrición del Instituto de Ciencia y Tecnología de Alimentos y Nutrición (ICTAN-CSIC)), ***"Café y chocolate: de alimentos prohibidos a alimentos para la prevención de enfermedades"***.

12:45-Coloquio presidido por el Vicerrector de Investigación de la UCLM, **D. José Julián Garde López-Brea,** el Decano de la Facultad, **D. Ángel Ríos Castro**, y el Director del IRICA, **D. Félix A. Jalón Sótes.** Estará precedido por la presentación "Experiencias de una trayectoria científica" por **Victoria Gómez Almagro (Contratada Ramón y Cajal, UCLM).**

14:00- Clausura del acto.

## PATROCINADORES:

**Para más Información:** AnaRaquel.Osa@uclm.es
**Enviar inscripciones a:** Alberto.Ramos@uclm.es **hasta 3 Junio**



# X SIMPOSIO CIENCIA JOVEN 2016

*Salón de Actos de la*

***Facultad de Ciencias y Tecnologías Químicas***

*8-10 de Junio de 2016*

CRÉDITO DE LIBRE CONFIGURACIÓN: La Universidad de Castilla-La Mancha concede 1 crédito de libre elección
DIPLOMA DE ASISTENCIA A TODOS LOS PARTICIPANTES
y
I PREMIO CIENCIA JOVEN FACULTAD DE CIENCIAS Y TECNOLOGÍAS QUÍMICAS

***Organización:***

Ángel Ríos Castro, Decano de la Facultad
Alberto Ramos Alonso "Química Inorgánica"
Ana Raquel de la Osa Puebla "Ingeniería Química"
Ana Martin Pacheco "Química Orgánica"
Gema M. Duran Lizcano "Química Analítica"
José Pérez Navarro "Ciencia y Tecnología de Alimentos"
Julián Rodríguez López "RSEQ"

## Miércoles 8 de Junio 2016

11:30- Entrega de la documentación

11:50- Bienvenida a los asistentes.

12:00-**Conferencia Invitada: Prof. D. José Luis Sotelo** (Dpto. Ingeniería Química, Facultad de Química, Universidad Complutense Madrid). ***"Eliminación de contaminantes prioritarios en aguas".***

12:45- Sesión de Presentaciones I

- *"Composition and properties of pistachio virgin oils and its by-products from different cultivars"*. **Rosa María Ojeda Amador**. *Tecnología de Alimentos.*
- *"Chiral N,N,Cp-scorpionate zinc alkyls as effective and stereoselective initiators for the living ROP of lactides"*. **Sonia Sobrino Ramírez.** *Química Inorgánica.*
- *"Wastewater management in the pharmaceutical industry"*. **José Fernando Pérez.** *Ingeniería Química.*
- *"The metabolic response to ingestion of a bolus of fat is conditioned by the age"*. **Alejandro Fernández Briones.** *Bioquímica.*

14:00-16:00 Descanso para la comida

16:00- Sesión de Presentaciones II

- *"Determination of biomolecules by Chemiluminescence Immunoassay (CLIA)"*. **Elisa Jiménez García.** *Química Analítica.*
- *"Smart self-healing hydrogels based on graphene"*. **Cristina Martín**. *Química Orgánica.*
- *"Animal waste valorization through thermochemical processes"* **María Fernández López.** *Ingeniería Química.*
- *"New ferrocenyl derivatives as potential drugs for breast cancer treatment"* **Borja Díaz de Greñu Puertas.** *Química Inorgánica.*

17:00- Receso

17:30-**Conferencia Invitada: Prof. Rachid Salghi** (National School of Applied Science, Ibn Zohr University, Morocco). ***"Phytobac and electrocoagulation: two practical management tools for pesticides wastewaters".***

18:15- Sesión de Presentaciones III

- *"Valorization of by-products derived from the vine by ultrasonic extraction"*. **Lourdes Marchante Cuevas**. *Tecnología de Alimentos.*
- *"The Role of Quantum Dots for the Development of Analytical Methodologies"*. **Gema María Durán Lizcano.** *Química Analítica.*
- *"Direct synthesis of high quality liquid fuels through Fischer-Tropsch synthesis"*. **Ana Raquel de la Osa Puebla.** *Ingeniería Química.*
- *"Signalling Pathways Affected in Alzheimer's Disease Human Brains"*. **Patricia Alonso Andrés**. *Bioquímica.*

## Jueves 9 de Junio 2016

9:30- Inauguración por el Rector Magnífico de la Universidad de Castilla-La Mancha **Dr. D. Miguel Ángel Collado Yurrita.**

10:00-**Conferencia Invitada: Prof. D. José Cernicharo**. (ICMM-CSIC Madrid). ***"Astroquímica: complejidad química en el espacio".***

10:45- Sesión de Presentaciones IV

- *"NMR micro-coils as an alternative for chemical processes monitorization"*. **José Miguel Mateo.** *Química Orgánica.*
- *"New applications of ion exchange resins in enology"*. **Ricardo Jurado Fuentes.** *Tecnología de Alimentos.*
- *"New technique to produce Hydrogen: Electrochemical reforming of alcohols"*. **Ana Belén Calcerrada**. *Ingeniería Química.*
- *"Dialkylboron guanidinates: synthesis, structure and carbodiimide de-insertion reactions"*. **Alberto Ramos Alonso**. *Química Inorgánica.*

11:45- Café

12:15-Presentación de la Sección Territorial de la Real Sociedad Española de Química, **Dr. Julián Rodríguez López**

12:30 Sesión de Presentaciones V

- *"Phenolic composition of red wines elaborated from minor grape cultivars from the Spanish region of La Mancha"*. **José Pérez Navarro**. *Tecnología de Alimentos.*
- *"Synthesis of biomaterials based on renewable resources"*. **Juan Carlos de Haro.** *Ingeniería Química.*
- *"Biomass as a renewable energy source. New methodologies for conversion of lignocellulosic waste into biofuel precursors"*. **Almudena Lorente Diezma.** *Química Orgánica.*
- *"Separation techniques coupled to ICP-MS for the determination of gold nanoparticles and dissolved gold species in culture medium and cells"*. **Sara López Sanz.** *Química Analítica.*

14:00-16:00 Descanso para la comida

16:00-**Conferencia Invitada: Abderrahmane Boujakhrout** (Grupo De Electroanálisis y (Bio)Sensores Electroquímicos, Dpto. Química Analítica, Universidad Complutense Madrid). ***"Nanomateriales híbridos para biosensores electroquímicos".***

16:45- Sesión de Presentaciones VI

- *"Volatile and sensory profile of verdejo white wines treated with oak chips at different winemaking stages"*. **Juan Antonio Delgado Sánchez-Migallón**. *Tecnología de Alimentos.*
- *"Preparation of platinum complexes as anticancer agents"*. **Sergio Blázquez González.** *Química Inorgánica.*
- *"Preconcentration strategies with nanoparticles in biological samples for analysis by capillary electrophoresis"*. **Isabel Lizcano Sanz.** *Química Analítica.*
- *"Pesticides removal with aerobic acclimated bacterial culture"*. **María Belén Carboneras Contreras.** *Ingeniería Química.*

17:45- Receso

18:15-Sesión de Presentaciones VII

- *"Determination of catechinic antioxidants in tea"*. **Eulalia Valverde Jativa.** *Química Analítica.*

# ASISTENTES AL 11th YOUNG SCIENCE SYMPOSIUM 2017

## Comité Organizador:


| | |
|---|---|
| Ángel Ríos Castro | Angel.Rios@uclm.es |
| Alberto Ramos Alonso | Alberto.Ramos@uclm.es |
| Ana Raquel de la Osa Puebla | AnaRaquel.Osa@uclm.es |
| Maria Luz Sánchez Silva | MariaLuz.Sanchez@uclm.es |
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## Ponentes invitados:


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