Seminarios itinerantes

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5 a 13 de Octubre 2015

Luminescent metal complexes and their assemblies

Lunes, 5 de Octubre, **Instituto de Síntesis Química y Catálisis Homogénea**
12 h, Sala de Grados de la Facultad de Ciencias, Universidad de Zaragoza (sola@unizar.es)

Miércoles, 5 de Octubre, **Universidad de La Rioja**
12 h, Aula Magna del CCT, Logroño (elena.lalinde@unirioja.es)

Viernes, 9 de Octubre, **Universidad de País Vasco UPV-EHU**
11 h, Sala de Actos, Facultad de Química, San Sebastián - Donostia (zoraida_freixa@ehu.es)

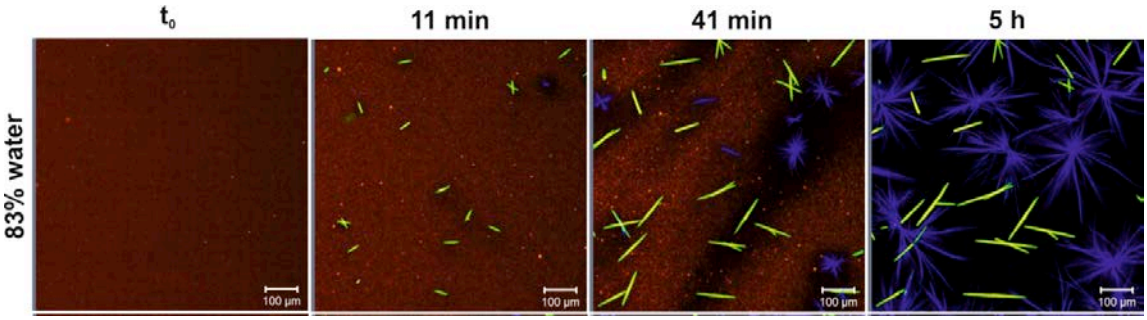
Martes, 13 de Octubre, **Universitat Jaume I**
11:30 h, Seminario Edificio de Investigación I, Castellón (eperis@uji.es)

GEQO Grupo Especializado de Química Organometálica de la Real Sociedad Española de Química

RSEQ Real Sociedad Española de Química
El Sitio de la Química en España

Luminescent molecules that can undergo self-assembly are of great interest for the development of new materials, sensors, biolabels…. The talk will illustrate some of the recent results on soft structures based on metal complexes able to aggregate in fibers, gels and soft mechanochromic materials [1]. The use of platinum complexes as building block for luminescent reversible piezochromic and mechanochromic materials will be illustrated. The emission of the compounds can be tuned by an appropriate choice of the coordinated ligands as well as of their aggregation in different structures. The formation of soft assemblies allows the tuning of the emission color, by pressure and temperature leading to a new class of materials possessing reversible properties. We demonstrate how even small changes in molecular design can completely inhibit or enhance the formation of organized supramolecular architectures, leading to a deep understanding of the key factor affecting the whole self-assembly process.

For some of the compounds we have indeed unraveled a highly complex supramolecular landscape comprising two kinetic assemblies and the thermodynamic isoform. We have not only characterized all the assemblies, but also the full chemical management is successfully achieved by the proper use of supramolecular and photochemical approaches. The monitoring of the different emission properties, used as fingerprint for each of the assembled species, allowed an unprecedented real-time visualization of the evolving self-assemblies [2]. We have been able to control the assemblies and obtain uniform size of the aggregate that can even be converted in a thermodynamic unstable species by light. The full control of multiple pathways opens the way to design complex systems in and out of their thermodynamic equilibrium.



The assembly processes can also be studied in confined spaces. The use of zeolites and mesoporous silica able to entrap precursor for the formation of product with defined conformation and properties is shortly illustrated.

References

[1] C. A. Strassert, L. De Cola et al. *Angew. Chem. Int. Ed.*, **2011**, *50*, 946; M. Mauro, L. De Cola et al. *Chem. Commun*. **2014**, *50,* 7269.

[2] A. Aliprandi, M. Mauro, L. De Cola *Nature Chemistry* in press.

Luisa DE COLA obtained the Laurea in Chemistry in 1983 at the University of Messina (Italy) under the supervision of Prof. Raffaelo Romeo. From 1984 to 1986 she worked as a postdoctoral fellow with Prof. Lidia M. Vallarino at the Virginia Commonwealth University (Richmond, USA) and afterwards joined the group of Prof. Vincenzo Balzani at the CNR in Bologna. In 1987-1988 she was visiting researcher at the University of Friburg (Switzerland) with Prof. Alex von Zelewsky. She became assistant professor at the University of Bologna in 1990, and in 1998 moved to the University of Amsterdam to hold the chair of molecular photonic materials. In 2005 she got the chair of nanoelectronics and nanophotonics at the University of Münster (Germany). Since September 2013 she is full professor and AXA chair of supramolecular and biomaterials chemistry at the Institute de Science et d'Ingénierie Supramoléculaires, ISIS, University of Strasbourg, France. She is also adjunct scientist at the Karlsruher Institut für Tecnologie (Germany).

Her main research interests are in luminescent and electro-luminescent materials for optical and electroluminescent devices and in nanomaterials for imaging diagnostics and therapy.

She has published more than 300 papers and filed 35 patents. She is member of the editorial board of Chemistry of Materials (ACS), ChemPhysChem (Wiley), ChemPlusChem (Wiley) and Material Horizons (RSC).

Awards and Professional Appointments

1986	Prize for chemistry "Fondazione U. Bonino e M.S. Pulejo"
1987-1989	CNR scholarship
1992-1997	Scientific Advisor at the F.R.A.E.-CNR, Bologna.
1993	Prize for Chemistry of the "Accademia di Scienze Fisiche e Matematiche di Napoli".
1995	Federchimica National Prize "per un futuro intelligente (for a smart future)".
1995	International Prize of the European Photochemistry Association "Grammaticakis-Neumann"
2004	Finalist of the Descartes Prize 2004
2003-2007	Member of the Advisory Board for the Chemistry Department, Imperial College of London
2009	European Research Council, ERC Advanced Grant Award
2010	Speaker at the Frontiers of Chemistry Conference, Paris May 2010 (4 Nobel Laureates and 4 other speakers)
2011	IUPAC prize for the most distinguished women in the field of chemistry and chemical engineering
2012	Gutenberg Chair Award
2012-2013	Speaker (2012) and President of the Bürgenstock Conference 2013
2013	Member of the Academia Europeae
2014-	Chevalier de la Légion d'Honneur appointed by the President of the Republic of France, François Hollande
2014-	Member of the German Academy of Sciences Leopoldina
2014-	International Prize for Chemistry from the Academia dei Lincei (Tartufari Prize) given by the President of the Republic of Italy, Giorgio Napolitano

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