

# DAY 1

Keynote Forum



6<sup>th</sup> Edition of International Conference and Exhibition on

# Organic Chemistry

August 16-17, 2018 | Dublin, Ireland

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Dublin, IrelandAdrien Braud, J Org Inorg Chem 2018, Volume 4  
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## FIRST AID TREATMENT OF CHEMICAL INJURIES

### ADRIEN BRAUD

Laboratoires Prevor, France

**P**REVOR is a toxicology laboratory specialised in the emergency management of chemical splashes. Chemicals and their associated risks are a real concern. History has shown that the traditional use of water as a mean of emergency decontamination, whilst beneficial, has its limits. These limits may result in a chemical burn. Scientific advancement and deep understanding of the chemical injuries mechanism have allowed new rinsing solutions to be developed which permit to prevent or reduce the seriousness of chemical injuries. The specificity of hydrofluoric acid burns and its first aid management will also be detailed through industrial case reports and scientific experiments. Finally practical information will be shared, on the use of these medical devices at the workplace.



#### Biography

Adrien Braud is a technical advisor for first aid decontamination solution in the industries, chemical and petrochemical plants, heavy industries, semi-conductors, laboratories, food industry, aeronautics, mining industry. Advisor on first aid management of chemical splashes. Advisor on management on chemical spills and leaks in the industry. Training of industrial personnel on site about first aid measures of decontamination of chemical splashes..

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## REUSABLE MESOPOROUS SOLID-BASED Pd CATALYSTS FOR C-C BOND FORMATION IN WATER

**Ying Wan**

Shanghai Normal University, P R China

Environmentally benign, operationally simple, and robust reactions, particularly those employing reusable solid catalysts and water as a solvent, are of significant interest to the chemical industry. Here, heterogeneous palladium catalysts supported on ordered mesoporous carbonaceous nanocomposites including carbon-silica, CoO-C and quaternary ammonium phase transfer agent modified mesoporous carbonaceous resins, were applied to the water-mediated C-C bonds formation. The mesoporous Pd/CoO-C catalyst showed a high yield of biphenyl (49%) in the water-mediated Suzuki coupling reaction of chlorobenzene and phenylboronic acid. Product yields in the reaction of aryl chlorides containing electron-withdrawing groups attached to their benzene ring can reach approximately 90%. Very small Pd clusters consisting of approximately 3 atoms and Pd-O bonds formed on the interface between CoO and Pd nanoparticles. The unsaturated coordinative Pd may be responsible for the activation of chlorobenzene in the absence of any additives or ligands. A nitrogen-containing functional group modified and ordered mesoporous resin material was also used to support a reusable solid Pd catalyst. The grafted quaternary N coordination with highly dispersed Pd NPs creates an electronically rich environment for surface atoms and causes a distinct enhancement in the stabilization and accessibility of these particles to organic substances in aqueous solution. The mesoporous Pd catalysts are active in the C-2 arylation of N-methylindole when water is used as the solvent without any other additive or the exclusion of air. The catalysis likely occurs on the Pd surface rather than in solution. thiol-functionalized mesoporous silica, which can trap soluble Pd species, was

used to confirm the negligible leaching in solution and therefore heterogeneous reaction. These heterogeneous catalyst are stable, showing unobvious activity loss after ten catalytic runs. Additionally, uniform mesopores and the hydrophobic nature of the carbon support may also facilitate the mass transfer of the reactant molecules and enrichment inside pores.

### Recent Publications

1. L Djakovitch and F X Felpin (2014) Chem. Cat. Chem. 6(8):2175-20187.
2. L L Duan et al. (2016) An efficient reusable mesoporous solid based Pd catalyst for selective C2 arylation of indoles in water. ACS Catal. 6(2):1062-1074.

### Biography

Ying Wan received her PhD Degree in Industrial Catalysis from the East China University of Science and Technology in 2002. She is a Professor of Chemistry in Shanghai Normal University, P R China. She joined the university and was promoted to a Full Professor in 2006. She is currently the Leader of the Program for Innovative Research Team at the same university, China. She has contributed to about 70 peer-reviewed scientific publications with more than 7000-times citations and 3 books. She has been an Associate Editor of *Journal of Porous Materials* since 2013. Her research interests include: sintering and poisoning-resistance metal nanocatalyst supported on mesoporous carbons, and their applications in green organic synthesis and energy chemistry.

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# DAY 2

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## SYNTHESIS OF MULTI-COMPARTMENT NANOEMULSIONS FOR LOCALIZED CO-DELIVERY OF DIFFERENT CLASSES OF OIL-SOLUBLE DRUG MOLECULES

**Thomas G Mason**

University of California Los Angeles, USA

Using two different highly non-equilibrium synthetic approaches, we have created new kinds of stable oil-in-water nanoemulsions composed of complex multi-compartment nanoscale droplets. Each nanodroplet contains three different types of mutually immiscible oils in separate internal compartments. Consequently, each internal compartment can hold a different class of oil-soluble drug molecules. By analogy to Janus droplets, which contain two different immiscible oil types and are named after the mythological two-faced deity of doorways, we call these compartmentalized triple-oil droplets "Cerberus" droplets, after three-headed watch-dog in the same mythology. In a first synthetic approach, we combine three simple microscale oil-in-water emulsions, each made using a different oil type (aliphatic, aromatic, or fluoro siloxanes), and subject this mixed microscale emulsion to extreme flow conditions using a high-pressure microfluidic homogenizer. In addition to causing droplet rupturing towards the nanoscale, the extreme flow also overcomes the stabilizing interfacial repulsion of the water-soluble ionic surfactant, leading to flow-induced droplet fusion. The multi-compartment nanodroplets in these complex oil-in-water nanoemulsions are so small that optical microscopy methods cannot resolve the internal interfaces that separate the internal compartments. So, instead, we have developed the use of cryogenic transmission electron microscopy (C-TEM) to reveal the compartmentalization of these three oils inside

the resulting Cerberus nanodroplets. In a second approach, we create Cerberus droplets using self-limiting droplet fusion reactions obtained by transiently destabilizing a mixed emulsion containing droplets of the three different oil types using an ionic amphiphile having the opposite charge. Based on these results, we create a classification scheme for different kinds of Cerberus droplet morphologies. In pharmaceutical applications, Cerberus nanoemulsions can be tailored to provide local co-delivery of a wide range of non-aqueous drug molecules, thereby overcoming limitations related to poor molecular solubility in certain oil types.

### Biography

Thomas G Mason received his PhD from Princeton University (USA) in 1995. He completed a first Postdoc at the CNRS Paul Pascal Research Institute in Bordeaux in physical chemistry and a second Postdoc at Johns Hopkins University in chemical and biomolecular engineering. Following 6 years as a principal investigator research scientist in industry, in 2003, he joined University of California Los Angeles as an Assistant Professor of physical chemistry and physics. He was promoted to Full Professor in 2009. He has published more than 120 papers in peer-reviewed journals and is an Inventor on 15 issued patents. He has received Princeton's Joseph Henry Prize, Intel's New Faculty Award, and NSF's CAREER Award, and is a Fellow of the American Physical Society.

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## NOVEL ENANTIOSELECTIVE ORGANOCATALYTIC TRANSFORMATIONS INVOLVING RAUHUT CURRIER REACTION

**HIROAKI SASAI**

THE INSTITUTE OF SCIENTIFIC AND INDUSTRIAL RESEARCH, OSAKA UNIVERSITY, JAPAN

**N**ovel enantioselective organocatalytic transformations involving Rauhut Currier (RC) reaction will be presented. The reaction started from symmetrical cyclohexadienones and allenates to give tetrahydrobenzofuranones bearing a chiral tetrasubstituted stereogenic center in up to 96% ee with high diastereo-, regio-, and chemo-selectivity. In addition, a facile method for the construction of methylened lactams will also be introduced. The reaction proceeds via an amidation/RC reaction sequence starting from symmetrical cyclohexadienone derivatives and acryloyl chloride promoted by a newly developed chiral acid-base type organocatalyst.

### Biography

Hiroaki Sasai pursued PhD in 1985 from Keio University, Tokyo, Japan. After working as an Assistant Professor at Hokkaido University, he moved to the University of Tokyo (Lecturer and then Associate Professor) in 1992 and then moved to the current position in 1997. He is a recipient of 1995 PSJ Award for young scientists and the Fluka Prize "Reagent of the Year 1996". He also received CSJ Award for Creative Work in 2006, the Molecu-

lar Chirality Award in 2011, Synthetic Organic Chemistry Award in 2016 and Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology, Japan in 2018. His research interests lie in enantioselective catalysis and conceptually new functional materials.

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