Sustainability as a driver for innovation

Fabrice Gallou
Novartis Distinguished Scientist – Director Science & Technology Chemical Development, Novartis

Distinguished Scientist at Novartis, received his Ph.D. at The Ohio State University in 2001, after which he moved to Boehringer-Ingelheim USA, working as a process chemist responsible for route scouting and supply of early phase programs. He subsequently moved in 2006 to the Chemical Development group at Novartis, Switzerland, as a process development chemist, and became in 2008 responsible for global scientific activities, overseeing development and implementation of practical and economical chemical processes for large scale production of APIs. His research interests rely in the research and development of sustainable synthetic methodologies intended for large scale implementation. For the last decade, he has been spearheading the development of chemistry in water using surfactants, focusing on its use and impact on chemo and biocatalysis. He published more than 200 peer-reviewed papers, book chapters, and patents, and won multiple awards, more recently the 2019 Swiss Chemical Society Senior Industrial Award, and the 2019 Yves Chauvin Award from the French Chemical Society.

Abstract

During our evaluation of the potential of surfactant technology, we have identified a variety of straightforward and highly advantageous transformations and applied them successfully on-scale on various chemo and biocatalytic transformations. Implementation of the technology typically results into significant benefits across our entire portfolio, not just from an environmental standpoint but also from an economic and productivity perspective. To name a few: reduction of organic solvent consumption, water use and cycle time, milder reaction conditions, improved yields and selectivities, which all contribute to improved process performance and lower manufacturing costs.
These surfactant mediated reactions can be up-scaled in the already existing multi-purpose facilities of pharmaceutical or chemical organizations, using a catalytic amount of a combination of a non-ionic designer surfactant (e.g. TPGS-750-M, PS-750-M) in water, and a well-chosen organic co-solvent instead of traditional and undesirable organic solvents. We now start gaining insight onto the physical phenomena involved and the role of the various components of the system and utilize this know-how to design even better catalytic systems.

**Green chemistry and unconventional methods of activation to produce high added-value molecules in a context of circular economy**

**Grégory Chatel**
Associate Professor maître de conférences HDR à l'Université Savoie Mont Blanc et au laboratoire EDYTEM (UMR 5204, USMB/CNRS)

Dr. Gregory Chatel received his PhD degree in 2012 from the Université de Grenoble (France). He then joined Prof. Rogers’ group at The University of Alabama (USA) as a postdoctoral research fellow. At the end of 2013, Dr. Chatel joined the Institut de Chimie des Milieux et Matériaux de Poitiers (IC2MP, Université de Poitiers, France) as an Assistant Professor. In 2016, he joined the the Laboratoire de Chimie Moléculaire et Environnement (LCME, Université Savoie Mont Blanc, France), where he performed research in green chemistry and sonochemistry for biomass and waste valorization as well as processes of fine chemistry. He completed his habilitation in 2018 and is now associate professor at the EDYTEM Institute (CNRS/Université Savoie Mont Blanc). In 2020, he received the silver medal of the European Young Chemists’ Award from the European Chemical Society (EuChemS).

**Abstract**

Through several examples of waste and biomass valorization projects involving unconventional activation methods such as ultrasound, microwaves, supercritical fluids and others, this presentation will discuss how these innovations can contribute to the production of added-value chemicals in a context of bioeconomy and circular economy. More globally, it is interesting to wonder what could be the impacts of chemistry in circular economy projects. The importance of multidisciplinary, collaborative and territorial approaches will be particularly discussed in this context.
14 octobre 2022
14h - 17h

Inscription gratuite mais obligatoire!

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