

Weimar 2015: Catalysing Tomorrow's Solutions

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In Weimar

The Annual Meeting of the German Catalysis Society (GeCatS) took place in the historical city of Weimar in the state of Thuringia where the German authors Goethe and Schiller already shared creative ideas to come to highlights in literature and science. The setting provoked discussions on topics ranging from catalytic conversion of biomass to the development of oxidation catalysts. This year's 48th meeting took place from Wednesday March 11th to Friday the 13th which did not shed a bad omen on the meeting at all! More than 580 participants took part in this year's meeting, more than ever before, following the steadily increasing trend over the last years. The scientific program consisted of 31 presentations and 5 plenary lectures. A total of 307 posters were presented covering topics from industrial and academic research in 16 distinctive categories. A special interest was recognised in the fields of catalyst preparation, conversion of bioresources and selective hydrogenation/dehydrogenation, reflected in the number of contributions (29, 31 and 31, respectively) in these fields. Furthermore, two poster workshops on catalyst synthesis and selective oxidation/reduction, respectively, were organised by YounGeCatS, in which selected poster contributors highlighted their research in short oral communications. In addition to the scientific program, 21 companies presented their latest developments and equipment related to catalysis research and catalyst characterisation throughout the conference. This reflects the character of the meeting as a place where advances in mature technology are presented next to novel application fields for catalysis.

Highlights in Catalysis

Johannes A. Lercher (TU München) kick-started the conference, by giving the François Gault Lecture on “Enhancing catalytic rates in constraints—from acid–base to metal catalysed reactions”. He impressively showed how the confined space of reaction sites within zeolites influences the rate of catalytic reactions on acidic sites, as well as on framework metals. Marcus Rose (RWTH Aachen University) introduced the audience into the catalytic conversion of bio-based platform chemicals by opening the following session whereby the other lectures focused on immobilisation technologies for organocatalysts and the production of acrylates from carbon dioxide. After a coffee break the program proceeded with three lectures on photocatalysis, amongst others the water splitting reaction was presented by Roland Marschall (Justus-Liebig-University, Gießen). The remainder of the day was dedicated to poster presentations, starting with two poster workshops with seven contributions on selective oxidation/reduction and catalyst preparation, respectively. Young scientists were thereby given the opportunity to discuss their work in short oral presentations with a broader audience. Out of those contributions Corinna Busse (Friedrich-Alexander University Erlangen-Nürnberg) and Michael Keßler (University of Cologne) were awarded a book prize, courtesy of Wiley-VCH, for their contribution to the sessions Selective Oxidation/Reduction and Catalyst Preparation, respectively (Figure 1). The scientific part of that day finished with the first poster party with the first half of the 307 posters.



Figure 1. YounGeCatS poster workshop prize awardees: Michael Keßler (University of Cologne, represented by Dr. Martin Prechtel, centre left) and Corinna Busse (Friedrich-Alexander University Erlangen-Nürnberg, represented by Yingxue Zhang, centre right) for the workshop on catalyst preparation and selective oxidation/reduction, respectively, with Dr. Stefan Kaluza (left) and Dr. Christoph Sprung (right) representing YounGeCatS, respectively, and Dr. Elke Maase (centre) representing Wiley-VCH.



Figure 2. The Alwin Mittasch laureate Prof. Robert Schlögl (Fritz Haber Institute of the Max Planck Society, Berlin and Max Planck Institute for Chemical Energy Conversion, Mülheim an der Ruhr, centre left) together with Prof. Martin Muhler (Ruhr University Bochum, representing GeCatS, left), Dr. Dirk Demuth (BASF SE, Ludwigshafen, centre right) and Prof. Kurt Wagemann (DECHEMA, right).



Figure 3. The Jochen Block prize awardee Dr. Mirza Cokoja (TU München, centre) and Prof. Martin Muhler (Ruhr University Bochum, representing GeCatS, left), and Prof. Richard W. Fischer (Clariant GmbH and TU München, right)

The combination of catalysis on bio-resources and homogeneous catalysis was highlighted by Hans de Vries (Leibniz Institute for Catalysis, Rostock) in his lecture on "Catalytic conversion of renewable resources into bulk and fine chemicals". Amongst others he emphasised a route to adipic acid starting from lignocellulosic biomass employing homogeneous and heterogeneous catalysts in the key conversion steps. At this point the program continued with two parallel sessions on emission reduction and homogeneous catalysis, respectively. The topic of conversion of renewable resources was picked up again after the break, whereby four lectures covered topics of olefin metathesis, as well as selective de-oxygenation of biomass substrates. In parallel, a session on catalysts for electrochemical applications was held. Here the lecture by Christian Reller (Siemens AG, Erlangen) on electrochemical conversion of CO₂ was of specific interest.

As a special offer for the younger participants especially for the PhD students and postdoctoral students YounGeCatS [1] organised an "Entrepreneur Forum" where the interested audience was brought in contact with Marek Checinski (CreativeQuantum GmbH, Berlin), a successful entrepreneur sharing his story on how he made a living out of the science he enjoys. Secondly, an introduction to the German funding opportunities for founders was given by Peter Mende from the Forschungszentrum Jülich GmbH, and patent considerations on this topic were conveyed by Malaika Fischbach from the European Patent office Munich.

The conference peaked with the GeCatS party, which featured a delicious live cooking buffet, fantastic live music and plenty of room to dance and socialise. A highlight of that evening was the ceremony for the Alwin Mittasch prize, which was awarded to Robert Schlögl (Fritz Haber Institute of the Max Planck Society, Berlin and Max Planck Institute for Chemical Energy Conversion, Mülheim an der Ruhr) for his profound and wide-ranging contributions to the characterisation of catalytically active materials under working conditions and the resulting impact on preparation and understanding of industrial catalysts. (Figure 2). Mirza Cokoja (TU München) was honoured with the Jochen Block Award for his work in the field of homogeneous catalysis in the epoxidation of olefins with metal free catalysts (Figure 3).

Friday, the final day of the conference, started with lectures given by the two award winners. Prof. Schlögl presented stunning details of catalysts, emphasising the need for thorough and unambiguous interpretation of the applied analytical methods, in order to reveal more of catalysts under working conditions. Afterwards Dr. Cokoja gave insights into his work about olefin epoxidation in which he catalytically applied perrhenates as anion in imidazolium-based ionic-liquids or nitrate-SIPs. In the following session, the higher alcohol synthesis was discussed, as well as CO₂-based energy storage by transformation into methanol. The plenary lecture by Horst-Werner Zanthoff (Evonik Industries, Marl) on the "Development of oxidation catalysts and processes in an industrial environment" closed the scientific program of this year's Weimar conference. The catalysts used to produce acrylates and their specific performance, were introduced in the light of changing raw material prices and propene availability in respect to the shale gas development in the USA. Overall, despite the clear current and upcoming changes in resource availability and demand, the necessity of future development of catalysts and catalytic processes was emphasised to maintain the high standard of industrial production and energy supply.

In a short closing ceremony, Dr. Nicole Schödel (Linde AG, Pullach) summarised the highlights of this year's conference inviting all participants to gather for the 49th meeting in one year time. This year's

meeting provided an interdisciplinary program across all disciplines in catalysis, with excellent plenary lectures and numerous possibilities for networking, generating an inspiring atmosphere for intellectual scientific exchange, beneficial to all participants. In 2016, the 49th annual meeting of the German Catalysis Society will take place from March 16th to 18th, of course in Weimar.