

Conference Report

15th International Congress on Catalysis

July, 1th – 6th 2012

Munich (Germany)

Marc Armbrüster, Malte Behrens, Barthel Engendahl,
Mehtap Özaslan, Marcus Rose, Christoph Sprung (YounGeCatS)

The world's leading scientists in catalysis met for one week in early July 2012 at the 15th International Congress on Catalysis hosted in Munich, organized by DECHEMA (Society for Chemical Engineering and Biotechnology). Leading chairman Prof. Johannes A. Lercher and honorary chairman and Nobel Prize laureate Prof. Gerhard Ertl brought this major event, which is taking place every fourth year, once again to Germany, 28 years after the 8th Congress held in Berlin. This major International Congress offers a unique blend of homogeneous, heterogeneous and electrochemical catalysis, and serves as a major forum for the discussion of interdisciplinary research from around the world.

The organizing committees involving leading scientists from academia and industry gave this congress the theme "From fundamental understanding to catalyst design and novel processes", reflecting the extensive spectrum of topics related to catalysis research. The Munich congress attracted more than 2200 participants from academia and industry from 60 different countries around the world. During the whole week of the congress, 42 exhibitors from chemical industry as well as other related companies presented their latest developments in lab and analysis equipment. Due to the outstanding high number of 263 oral and 1471 poster contributions as well as 44 poster symposia, the scientific program emphasized the importance of catalysis research and development.

The state of the art in catalysis was exemplified by six plenary lectures and 15 keynote lectures. The oral presentations were arranged into four parallel sessions accompanied by a session incorporating several poster symposia. These poster symposia grouped a number of poster contributions on selected topics. This was an excellent opportunity in particular for young researchers to present their results in front of an international audience and to meet other scientists in their fields, which triggered intense scientific discussions and exchange. All posters were presented during a poster party and two poster sessions. Additionally, electronic access was provided for the majority of the posters on poster-sized screens as e-posters.

The great variety of scientific topics for the sessions reflected the broad spectrum of catalysis research. It is obvious that recent research becomes more and more difficult to classify when restricted to the classical fields such as heterogeneous and homogeneous catalysis. In fact, the wide spectrum of research in the field of catalysis seems to increase its multidisciplinary character. Thus, topics were classified according to the different challenges related to their final applications. The sessions “Biomass conversion to fuels” and “Platform and specialty chemicals from renewables” dealt with the hot topic sustainable chemistry and emphasized the current shift of resources from fossils to renewables. Other emerging fields of catalysis were presented within the sessions on “Photocatalysis”, “Novel routes to catalysis via nanotechnology”, and “Organo-catalysis/biocatalysis”. Environmental challenges were highlighted in the sessions on “Mobile source emission”, “Catalysis in CO₂ capture, sequestration and utilization”, and “Cleaning exhaust streams”. Related topics were covered by the sessions on “Fuel cell catalysis” and “Advances in computational analysis” as well as “From mechanistic insights to advances in reactor technology”, which gave interesting insights into catalysis from a chemical engineering point of view. This emphasized the multidisciplinary character of catalysis research. Other sessions that presented the latest development in the classical fields of catalysis science like for instance fine chemistry or syngas conversion complemented the program. Selected and more specific topics such as “Methanol to olefins”, “Enantioselective Catalysis”, “Conversion of lignocellulosic biomass to fuels and chemicals”, and many more continued extensive discussions after the lectures, during the poster symposia, poster sessions, and coffee breaks.

One of the highlights for all participants were certainly the six plenary lectures given by leading scientists in their respective fields of expertise. Prof. Kazanuri Domen (University of Tokyo/Japan) had the honor to give the first plenary lecture. He presented the latest developments in the field of hydrogen production by water splitting on solid photocatalysts. Prof. Philippe Sautet (Ecole Normale Supérieure and CNRS/France) provided a more detailed understanding of catalysis by use of computational chemistry. The second day started with a lecture by Dr. Charlie Kresge (Dow Chemical Company, Midland, MI/USA) giving an overview on advanced catalysts for industrial polyolefin production. The fourth plenary lecturer Prof. Hans-Joachim Freund from the Fritz-Haber-Institute of the Max Planck Society in Berlin/Germany presented comprehensive insights into heterogeneously catalyzed reactions that can be deduced from well-defined model systems. Recent advances towards the understanding of the composition and structure of catalysts in relation to their activity and selectivity were highlighted by Prof. Alexis T. Bell (University of California, Berkeley, CA/USA). The final plenary lecture was given by Prof. Roy A. Periana (Scripps Research

Institute in Jupiter, FL/USA) on the importance of the design of molecular catalysts for small molecule activation and conversion especially related to energy and environmental issues.

In summary, the 15th International Congress on Catalysis in Munich was a great success. All researchers in the broad field of catalysis profited of the numerous outstanding contributions within the well-balanced program and excellent opportunities for intense networking. Both, the industrial and academic community exchanged ideas on which direction catalysis research will continue in the future. Last but not least, the social events such as the Poster Party, the Bavarian evening, the Students Party, and the Congress Dinner in a historical and culturally appealing location allowed combining scientific collaboration with a social get-together. This assisted to bridge the disciplinary gaps between the many fields in catalysis research. The scientific input and the personal interaction that the participants experienced on this meeting will certainly greatly stimulate further research in the whole area of catalysis for a greener and sustainable future.