

# 40th Conference 'Deutscher Katalytiker'

## PLATINUM GROUP METALS AT THE GERMAN CATALYSIS CONFERENCE

Reviewed by Thomas Ilkenhans

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The conference was held in Weimar, Germany, from 14th to 16th March 2007 (1). It was the 40th anniversary of this annual meeting, which was founded in 1967 in eastern Germany. The conference attracted more than 450 visitors from industry and academia, mainly from Germany. Forty lectures in two parallel sessions were presented, and there were more than 200 poster contributions. Of the six plenary lectures, four were given by international speakers. This selective review covers aspects of the presented work featuring the platinum group metals (pgms).

### Lectures

J.-M. Basset (École Supérieure Chimie Physique Électronique de Lyon, France) described in his plenary lecture: 'Catalysis: From Molecules to Materials', the progress of molecular and supramolecular chemistry for the rational design of catalysts. With numerous examples, such as for the pgm-catalysed metathesis of olefins, he gave illustrations of new developments.

In a lecture entitled 'New Thermally Stable Catalysts *via* Encapsulation of Metal Nanoparticles in MeO<sub>x</sub> Empty Spheres', M. Paul, M. Comotti, P. Arnal, P. Bazula and F. Schüth (Max-Planck-Institut für Kohlenforschung, Mülheim an der Ruhr, Germany) outlined an elegant synthesis of metal particles such as gold nanoparticles in a ZrO<sub>2</sub> hollow sphere. The Au nanoparticles are covered by SiO<sub>2</sub>, which is then coated with ZrO<sub>2</sub>. The SiO<sub>2</sub> can be removed chemically. The remaining ZrO<sub>2</sub> with encapsulated Au is thermally stable, and the Au particles are protected from sintering. The method can also be used for other precious metals such as platinum and palladium.

M. Beller (Leibniz-Institut für Katalyse e.V., Universität Rostock, Germany) gave a lecture on 'Homogeneous Catalysis – A Key Technology for the 21st Century'. As examples of topics success-

fully addressed, in terms of both fundamental research and technical application, Beller cited Pd-catalysed C–C coupling reactions and atom-efficient carbonylations.

### Poster Contributions

G. Incera Garrido, F. C. Patcas, G. Upper, M. Türk and B. Kraushaar-Czarnetzki (Universität Karlsruhe, Germany), presented a poster entitled: 'Preparation of Pt/SnO<sub>2</sub> Supported Catalysts for the CO-Oxidation: Comparison between Classical and Supercritical Pt Deposition'. The catalyst, prepared *via* supercritical carbon dioxide (scCO<sub>2</sub>) deposition of Pt, oxidised CO at 80°C with remarkable activity, whereas the catalyst made *via* conventional aqueous preparation shows no activity below 150°C.

S. Kureti and F. J. P. Schott (Universität Karlsruhe) presented a poster about 'Reduction of NO<sub>x</sub> by H<sub>2</sub> on Pt Containing Catalysts in Diesel Exhaust'. The preferred techniques to meet emission standards are NO<sub>x</sub> storage catalyst (NSR) and selective catalytic reduction (SCR), using NH<sub>3</sub> as reductant. However, a serious constraint on these technologies is that efficient NO<sub>x</sub> conversion is only achieved above 150°C. The European Commission Motor Vehicle Emissions Group (MVEG) (2) estimates that the exhaust temperature of diesel passenger cars is below 150°C for about 60% of the time, indicating a need for a technique to convert NO<sub>x</sub> in the low temperature range. The reduction of NO<sub>x</sub> by H<sub>2</sub> on Pt catalysts is considered to be a promising method. However, it is well known that the H<sub>2</sub>/NO<sub>x</sub> reaction on classical Pt/Al<sub>2</sub>O<sub>3</sub> gives N<sub>2</sub>O. To obtain selective production of N<sub>2</sub>, the catalyst was modified. The best catalyst so far gave 80% selectivity to N<sub>2</sub>.

A. Boonyanuwat, A. Jentys and J. A. Lercher (Technische Universität München, Germany) reported on: 'Hydrogen Production by Aqueous-

Phase Reforming of Glycerol on Supported Metal Catalysts'. Platinum and palladium on alumina show the best selectivities to hydrogen (greater than 90%), while rhodium also gave alkane selectivity. A stability test was carried out for two weeks at 498 K and 29 bars. During this time, the activity of the catalysts was almost constant.

## Concluding Remarks

In summary, the meeting in Weimar, the beautiful city of Goethe and Schiller, covered the whole range of heterogeneous and homogeneous catalysis from fundamental studies to industrial catalysis.

The 41. Jahrestreffen Deutscher Katalytiker will again take place in Weimar, from 27th to 29th February 2008 (3).

## References

- 1 40. Jahrestreffen Deutscher Katalytiker, DECHEMA Gesellschaft für Chemische Technik und Biotechnologie e.V.:  
<http://events.dechema.de/katalytiker07.html>
- 2 Enterprise, Automotive Industry, MVEG:  
[http://ec.europa.eu/enterprise/automotive/mveg\\_meetings/index.htm](http://ec.europa.eu/enterprise/automotive/mveg_meetings/index.htm)
- 3 41. Jahrestreffen Deutscher Katalytiker, DECHEMA Gesellschaft für Chemische Technik und Biotechnologie e.V.:  
<http://events.dechema.de/katalytiker08.html>

### The Reviewer



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