

Preface

This issue collects a selection of contributions presented at the conference “Catalytic Nano-Oxides Research and Development in Europe: Present and Future” held in Seville (Spain) on 16–19 May 2006, as Final Conference of the Coordination Action. “CO-ordination of Nanostructured Catalytic Oxides Research and Development in Europe (CONCORDE)”.

CONCORDE, funded by the European Commission under the Sixth Framework Programme, was aimed to improving the efficiency of the presently dispersed and disconnected research activities in the field of oxide catalysts and to accelerate their transfer of their outcome to the European chemical industry so as to improve its competitiveness. The objective of CONCORDE was to co-ordinate, at a true European scale, the R&D activities pursued in Europe on advanced metal-oxide nanomaterials used in catalysis, as a tool to boost their efficiency and to promote the application of these multifunctional materials to reactions relevant for a sustainable and environmentally friendly chemistry and for environmental protection. The co-ordination of R&D activities of CONCORDE was focused on the major advanced topics of research on metal-oxide catalysts, lumped in five main areas: advanced preparation methodologies; new insight in the catalytic, structural and surface chemistry of metal oxide; improve development and identification of new metal-oxide catalysts; improving catalytic performances and discovering new applications; catalytic reaction and catalyst preparation engineering.

This Final Conference was held as part of the general program of Workshops and Conferences of CONCORDE. This program included also the First Conference, entitled “Understanding the Dynamic and Transient Behaviour of Catalysts in Working Conditions and the Relationship with Catalytic Performance”, held in Louvain-la-Neuve (Belgium) in 25–28 January 2005 (see contributions published in *Catalysis Today*, Volume 112, issues 1–4, 15 March 2006), and the Second Conference, entitled “Nucleation, Growth, Microstructure and Matrices for Creating Nano-Dispersed Redox Oxide Catalysts in Oxidation Catalysis” held in Thessaloniki (Greece), in 26–28 January 2006 (see contributions published in *Applied Catalysis A: General*, Volume 325, Issue 2, 15 June 2007).

The Final Conference had two clearly differentiated parts: the first one, scientific and technical, and the second one devoted to give a broad overview of the research policy and

socio-economic issues in the field covered by CONCORDE in a European and global context. This issue of *Catalysis Today* includes a selection of contributions presented at the scientific and technical part, to which two full days of oral and poster sessions were devoted.

Metal oxides constitute a main class of catalysts playing a key role in the production of petrochemicals, intermediates and fine chemicals, in energy applications and in environmental protection. Nanotechnology opens new ways to get better design and performances of these catalysts. This Conference was organised to provide an updated state-of-the art and a general vision of the future of this R&D field. Advanced topics of research on nano-oxide catalysts and recent results on redox catalysis by oxides were addressed. The contributions emphasized the importance of understanding the features and action of catalysts at the nano-scale, and discussed present and future research works in several areas of this field (advanced preparation techniques, new insight on catalysts structure and function, advanced molecular modelling, new catalysts and applications, process intensification, green chemistry concepts, non-conventional reactor configurations, etc.). Results highlight these aspects in key technological processes such as selective oxidation, oxidative dehydrogenation, ammoxidation, photocatalysis and redox reactions in general, such as catalytic combustion, pollutant removal, reforming, etc. Following the overall strategy of CONCORDE, the contributions to the conference were quite multidisciplinary, ranging from theoretical modelling to advanced reactor concepts, including solid state chemistry, advanced characterization techniques, non-conventional synthesis methods, reaction kinetics, etc.

We think that results presented at the three CONCORDE conferences (see the references above) can constitute a significant contribution to the people working on metal-oxide catalysts: they open interesting perspectives of application of nano-oxides, as they provide advances in the preparation methodologies, molecular modelling, the knowledge of catalytic and structural surface chemistry of metal oxides under working conditions, and advanced reactor concepts. We hope this will help to identify and develop new oxide catalysts, to discover new applications, to improve catalytic reaction performances and to integrate new reactor configurations and engineering applications.

The Guest Editors gratefully acknowledge all the reviewers for their dedication, their responsibility and the serious work they accomplished in the revision of the manuscripts, and express their gratitude to the European Commission for funding the Coordinated Action “CONCORDE” and to the journal “*Catalysis Today*” for providing the opportunity of disseminating of the scientific activity carried out in CONCORDE.

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