

Preface

Outlooks for environmental catalysis

This issue collects a selection of contributions presented at the Third European Workshop on Environmental Catalysis “Environmental Catalysis: A Step Forward” held in Maiori (SA), Italy, on 2–5 May 2001. The meeting was organized by the Group of Catalysis of the Italian Chemical Society. The chairs of the organizing committee were Gabriele Centi (University of Messina, Italy), Paolo Ciambelli (University of Salerno, Italy) and Patricio Ruiz (University of Louvain La Neuve, Belgium).

The objective of the workshop was ambitious: to define state-of-the-art and guidelines for innovation in the field of environmental catalysis and highlight the new directions for research driven by market, social and environmental needs. The scope was to emphasize especially the following areas:

- Catalysis for energy-friendly technologies and processes (catalytic combustion and catalysis in fuel cells and devices using renewable sources, in fuel-efficient engines, in refinery and petrochemistry).
- New advanced cleanup catalytic technologies (cleanup of pollutants from automotive and stationary sources as well as in-house applications, restaurant emissions, air purification in indoor or road tunnel).
- Catalytic processes and technologies for reducing the environmental impact of chemical and agro-industrial solid or liquid waste and improving the quality and reuse of water.
- Catalytic processes for a sustainable chemistry (including eco-efficient processes in clean and non-conventional media, catalytic processes in organic syntheses and substitution of stoichiometric reactions).

- Replacement of environmentally hazardous catalysts in existing processes.

One hundred thirty four contributions (including keynote, oral and poster presentations) were given at the workshop. The abstracts of all contributions can be find at the following address: <http://www.scigic.org/activ.html>. A general overview of the main topics discussed during the meeting is also given in the introductory contribution of this issue.

Environmental catalysis has continuously grown in relevance over the last two decade, but especially the area of interest for research were rapidly expanding. From the traditional areas of NO_x and VOC control, research activities extended to a wide range of applications including various problematic related to the lowering of the environmental and energy impact of refinery and chemical production, and the improvement of eco-compatibility of non-chemical productions and transport. In all these applications catalysis reveals as the essential *tool to enable a sustainable production and mobility*.

With respect to other fields of catalysis, environmental catalysis is characterized by more demanding constrains in terms of possible conditions of operation. As a consequence a very innovative effort was necessary to find technical solutions which allow to meet social requirements of a high efficiency in reducing pollution and energy consumption and low costs of operations. Therefore, environmental catalysis can be viewed as a *pathway for innovation*.

Extending the use of catalysis is the third concept characterizing environmental catalysis. Catalysis has been often associated to only chemical productions, while a major area of application of environmental

catalysis is beyond the chemical process area. Examples are catalysts or catalytic technologies to: (i) reduce emissions in agro-food production, pulp and paper, electronic and metal finishing productions, etc.; (ii) remediate water and soil contamination; (iii) recycle solid waste such as polymers; (iv) improve quality of indoor or outdoor air; (v) improve use of natural resources and energy (including solar energy), etc. Therefore, environmental catalysis plays a key role in demonstrating the key role of catalysis as *driver for improving quality of life, health and environment*.

The sub-title of the workshop (*"A Step Forward"*) summarizes these three concepts of environmental catalysis as a tool to enable a sustainable production and mobility, pathway for innovation and driver for improving quality of life, health and environment. In fact, the sub-title evidences that environmental catalysis represents a step forward in using catalysis, but at the same time that a step forward is need to further innovate their area and modalities of application.

Innovation and new area of application, besides to scientific quality and originality were thus the criteria used for the selection of the contributions to the workshop and to this issue. All manuscripts were evaluated by at least two international referee which considerably helped in improving the quality of manuscripts is gratefully acknowledged.

The manuscripts are organized into the 11 topics listed above which represents also the main sub-topics of the workshop. The subjects discussed do not cover systematically all the aspects relevant for innovation in the specific topic, but rather give a good overview of the principal trends and state-of-the-art.

Due to limits in the number of acceptable manuscripts, it was not possible to include in this issue all interesting contributions. We encourage the reader to look at the book of the proceedings of the workshop which reports the extended (two pages) abstracts of all contributions and which is available on the web at the address cited above.

We believe that this issue of Catalysis Today and the book of the proceedings of the workshop demonstrate that environmental catalysis is a major area for mapping technological challenges to achieve economic benefits. We hope also that this issue of Catalysis Today is a further steps in this exciting direction.

Gabriele Centi*, Paolo Ciambelli
Siglinda Perathoner, Paola Russo

*Dip. di Chimica Industriale ed Ingegneria dei
Materiali, Universita di Messina
Salita Sperone 31, 98166 Messina, Italy*

*Corresponding author. Tel.: +39-090-676-5609
fax: +39-090-391518

E-mail address: gabriele.centi@unime.it (G. Centi)