



## Preface

## Special Issue on the 11th International Conference on Catalysis in Membrane Reactors



The 11th International Conference on Catalysis in Membrane Reactors, ICCMR11, was held in Porto (Portugal), the worldwide known “Port Wine” city, in July 2013, from 7th to 11th. It followed the previous meetings in Villeurbanne/Lyon (France, 1994), Moscow (Russia, 1996), Copenhagen (Denmark, 1998), Zaragoza (Spain, 2000), Dalian (China, 2002), Lahnstein (Germany, 2004), Cetraro (Italy, 2005), Kolkata (India, 2007), Lyon (France, 2009) and Saint-Petersburg (Russia, 2011). ICCMR12 will be held in Szczecin (Poland) in 2015.

The conference was attended by a little more than 170 persons, from academic research, applied research and industry, working in the fields of membranes, catalysis and process engineering, coming from 26 countries. To highlight recent developments and to create an interdisciplinary forum for discussion, so that to allow the germination of new ideas and concepts, 9 Key Note, 60 Oral and 94 Poster presentations were scheduled in several parallel sessions. Four motivating plenary lectures by distinguished researchers were also presented:

1. Gilbert Rios (University of Montpellier, France) in tandem with Alexander Netrusov (University of Moscow, Russia): Perspectives and opportunities for bio-catalytic membrane reactors in a bio-based economy & Biological membrane reactors.
2. King Lun Yeung (Hong Kong University of Science and Technology, Hong Kong): Membrane innovation in micro, mini and macro systems.
3. Tanja Vidakovic-Koch (Process Systems Engineering, Max-Planck-Institute for Dynamics of Complex Technical Systems, Magdeburg, Germany): Beyond fuel cells – Current prospects and challenges in electrochemical membrane reactors.
4. Roland Dittmeyer (IMVT, Karlsruhe Institute of Technology, Germany) in tandem with Nicole Schödel (Linde, Germany): Reactors with hydrogen permeable membranes – State-of-the-art and new ideas.

In addition, there was also a full afternoon session dedicated to the presentation of 7 European Projects related to the conference topics.

The ICCMR conference series have traditionally a strong interdisciplinary character, providing an opportunity for discussing the combination of membranes, catalysis and reaction engineering, in

the perspective of process intensification, as an overlapping interdisciplinary field. The topics covered by ICCMR11 were:

1. Membrane reactors and chemical catalysis.
  - (a) Synthesis applications.
  - (b) Environmental applications.
  - (c) Energy applications.
2. Ion-conducting membrane reactors.
  - (a) Mixed ionic and electronic conducting membranes.
  - (b) Pure ion conducting membrane reactors: fuel cells, electrolyzers and electrochemical synthesis.
3. Photocatalytic and photoelectrochemical membrane reactors.
  - (a) For water and waste water treatment.
  - (b) For air and gas applications.
  - (c) Sensors.
4. Membrane reactors and biocatalysis.
  - (a) Membrane bioreactors – Enzymatic and microbial systems for water, food and biotechnological applications.
  - (b) Microbial hydrogen production – Energy applications.
  - (c) Microbial and enzymatic fuel-cells – Sensors and biomedical applications.
  - (d) Biofouling – Monitoring and control of membrane bioreactors.
5. New design and concepts.
  - (a) Membrane and catalyst design.
  - (b) Reactor design (Contactors, Extractors and Distributors).
  - (c) Emerging applications.

Young researchers were especially encouraged to participate and to interact closely with senior scientists. For that, the *European Membrane Society* awarded the Two Best Oral Presentations and the Two Best Poster Presentations with a diploma and a free student membership to EMS, for students under 30 years old. Also the *European Membrane House* awarded the two best original works with potential for industrial application with a bank check of 500 €, one from the Oral Presentation Sessions and the other from the Poster Presentation Sessions, also for students under 30 years old.

A selected number of papers from both the Oral and Poster presentations were submitted for two different Special Issues, one in *International Journal of Hydrogen Energy* (papers somehow related to hydrogen and membranes) and the other one in *Catalysis Today* (papers somehow related to catalysis and membranes).

This special issue, containing 18 of such papers which we sincerely hope that may contribute as a valuable addition to the specialized literature on membrane reactors, is our last contribution for the ICCMR11. In the words (and messages) of many participants, ICCMR11 was a great conference in all aspects. For that, the organizers and the Guest Editors would like to acknowledge to all that contributed to this success: the participants, the sponsors (a special thanks for Dirk Nieepoort and Cristiano Van Zeller), the colleagues from the International Advisory Board who reviewed the abstracts submitted, the reviewers (many from outside the International Advisory Board) who carried out a strict reviewing process on the manuscripts submitted and the authors of the presented papers, for their contributions and careful revisions.

Finally, we wish to express our gratitude to the editorial team of *Catalysis Today*, for their agreement to publish these papers related to ICCMR11 and for their assistance.

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