Conference Editorial

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5th International IUPAC Conference on Green Chemistry (5th ICGC)

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The 5th International IUPAC Conference on Green Chemistry (5th ICGC) was held in Durban (South Africa) from 17 to 21 August 2014. This series of conferences was initiated and continues under the auspices of the IUPAC Subcommittee on Green Chemistry. The previous conferences were held in Dresden (Germany) in 2006, Moscow (Russia) in 2008, Toronto (Canada) in 2010 and Foz do Iguaçu (Brazil) in 2012.

The main objective of these conferences is to provide an ideal forum for sharing new developments in the field of green chemistry, emphasizing the importance of green chemistry for sustainable development and promoting novel research and novel collaborations by bringing together experts and interested parties from all over the world and from diverse bodies – from academia to industry and to governments. The core of green chemistry is the design of substances and production processes "that can reduce or eliminate the use and generation of hazardous substances". This objective responds to the increasing concern about the effects of pollutants on the environment and on human health. A key criterion is that prevention is better than treatment. It is better to prevent the formation of wastes rather than having to treat them. It is better to prevent the generation of hazardous substances or pollutants as the best measure to prevent damages from their presence or use. It is better to design safer production processes as the best measure to ensure that there will be no accidents or that there will be no damages even in the case of accidents. And it is better to monitor processes in real time to prevent accidents. The prevention criterion integrates with the criterion of saving resources (by pursuing the objective that all the input materials of a process are transformed into useful products) and saving energy. These objectives and criteria show the importance of green chemistry for the protection of human health and of the environment and for making development sustainable. Pursuing these objectives requires huge research efforts, because of the high number of substances and processes involved in the chemical industry and of the need to design new substances to replace the current ones when they are not environmentally benign, and to improve on the current processes or design new ones when they are not sufficiently safe, resources-efficient and energy-efficient. Interactions and exchanges of information play essential roles for the development of research. The ICGC provide an ideal forum for such exchanges, and also for interactions with decision makers such as representatives from the industry or from governments. The 5th ICGC was the first ICGC conference held in Africa, and it had the additional role of promoting further development of green chemistry in South Africa and in the African continent, and fostering links among African chemists and between African chemists and chemists from other continents, to collaborate on the key issues of green and sustainable chemistry.

The 5th ICGC was opened by the South African Minister of Science and Technology. It had 213 participants coming from 36 different countries, 6 plenary lectures, 13 keynote lectures, 104 oral presentations and 75 poster presentations. The scientific program included all the major themes relevant to green chemistry research and applications: green industrial processes, catalysis (heterogeneous, homogeneous, organic),

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organic synthesis, green solvents, energy storage, biofuels, green chemistry education, nanomaterials, polymers, ultrasound, microwave, policies, separation science, and an OPCW (Organization for the Prohibition of Chemical Weapons) session on the use of substances. Major sponsors were PhosAgro, OPCW, IUPAC, the Royal Society of Chemistry, the Department of Science and Technology of the Republic of South Africa, the University of Kwazulu-Natal and the University of Venda; several other sponsors also contributed to the conference.

This Issue of *Pure and Applied Chemistry* comprises selected full articles presented at the 5th ICGC conference.

Thanks are expressed to all the attendees and participants, the Editors of *PAC*, sponsors and partners, organizing and scientific committees for their contribution to the success of this conference. We can all look forward to the 6th ICGC, which will be held in Venice (Italy), 4–8 September 2016.