

# FOREWORD

Modern chemistry is one of the essential tools in pursuing better medical care, more efficient telecommunications and informatics, and increased agricultural production.

However, certain chemicals produced and used in large quantities might cause various hazards in environmental sectors, owing to their global (trans-boundary) translocation, as well as their intrinsically hazardous properties. To reduce environmental risk of such chemicals, international regulatory measures have already been taken [e.g., in response to the initiatives of the Intergovernmental Forum in Chemical Safety (IFCS)], including legally binding implementations and national capacity building in developing countries. Herein lies the urgent need for promoting worldwide research into green chemistry (sustainable chemistry), in which the invention and application of chemical products and processes are designed to reduce or to eliminate the use and generation of hazardous substances.

Indeed, green chemistry should encompass a variety of disciplines of fundamental chemistry in IUPAC, to encourage new trends of chemical research. Moreover, results of these researches could be effectively applied for solving environmental problems related to the production and use of chemicals and to create a new chemical industry in the future. As such, green chemistry research conforms completely to the mission-oriented activity of IUPAC to meet regulatory requirements for achieving environmentally sound management of chemicals. We sincerely hope that the present special issue highlighting the state of the art and future prospects of green chemistry research will encourage all chemists who intend to serve society through their research efforts.

**J. Miyamoto**  
**Past-President of IUPAC Chemistry and the Environment Division**

The increasing knowledge in natural sciences and the application of this knowledge are the driving forces for the development and welfare of mankind. Chemistry plays a central role in this development. Chemistry provides the molecular understanding of physical properties of materials and other matters and thus closely interacts with physics. Chemistry also provides the molecular understanding of living systems and is the basis for modern biology and medicine. The development and opportunities of synthetic chemistry have opened a new dimension for tailor-made materials and compounds for specific purposes. The driving forces for developments in chemistry have been very strong, and there is a demand for new and efficient processes and chemicals. Aspects of sustainable and environmentally friendly processes and chemicals have sometimes been lagging behind this demand.

Fortunately, chemistry also provides the tools for a green and sustainable development. Knowledge in this general area has to be integrated into the planning of all research and development in chemistry. There are specific research topics related to the development of green and sustainable processes, which need the input of new technology and novel chemistry. The present Symposium-in-Print provides an overview of recent research and development in the field. We hope that it will stimulate further activities in the field. It is planned as a first step in an IUPAC action on this subject. The IUPAC

Organic and Biomolecular Chemistry Division is grateful to its Subcommittee on Organic Synthesis and particularly Professor Pietro Tundo for initiating and engaging in this action, and to him and Profs. David StC. Black and Sofia Memoli for editing the Symposium-in-Print.

**Torbjörn Norin**  
**President of IUPAC Organic and Biomolecular Chemistry Division**