

Series Preface

With remarkable vision, Prof. Otto Hutzinger initiated *The Handbook of Environmental Chemistry* in 1980 and became the founding Editor-in-Chief. At that time, environmental chemistry was an emerging field, aiming at a complete description of the Earth's environment, encompassing the physical, chemical, biological, and geological transformations of chemical substances occurring on a local as well as a global scale. Environmental chemistry was intended to provide an account of the impact of man's activities on the natural environment by describing observed changes.

While a considerable amount of knowledge has been accumulated over the last three decades, as reflected in the more than 70 volumes of *The Handbook of Environmental Chemistry*, there are still many scientific and policy challenges ahead due to the complexity and interdisciplinary nature of the field. The series will therefore continue to provide compilations of current knowledge. Contributions are written by leading experts with practical experience in their fields. *The Handbook of Environmental Chemistry* grows with the increases in our scientific understanding, and provides a valuable source not only for scientists but also for environmental managers and decision-makers. Today, the series covers a broad range of environmental topics from a chemical perspective, including methodological advances in environmental analytical chemistry.

In recent years, there has been a growing tendency to include subject matter of societal relevance in the broad view of environmental chemistry. Topics include life cycle analysis, environmental management, sustainable development, and socio-economic, legal and even political problems, among others. While these topics are of great importance for the development and acceptance of *The Handbook of Environmental Chemistry*, the publisher and Editors-in-Chief have decided to keep the handbook essentially a source of information on "hard sciences" with a particular emphasis on chemistry, but also covering biology, geology, hydrology and engineering as applied to environmental sciences.

The volumes of the series are written at an advanced level, addressing the needs of both researchers and graduate students, as well as of people outside the field of

“pure” chemistry, including those in industry, business, government, research establishments, and public interest groups. It would be very satisfying to see these volumes used as a basis for graduate courses in environmental chemistry. With its high standards of scientific quality and clarity, *The Handbook of Environmental Chemistry* provides a solid basis from which scientists can share their knowledge on the different aspects of environmental problems, presenting a wide spectrum of viewpoints and approaches.

The Handbook of Environmental Chemistry is available both in print and online via www.springerlink.com/content/110354/. Articles are published online as soon as they have been approved for publication. Authors, Volume Editors and Editors-in-Chief are rewarded by the broad acceptance of *The Handbook of Environmental Chemistry* by the scientific community, from whom suggestions for new topics to the Editors-in-Chief are always very welcome.

Damià Barceló
Andrey G. Kostianoy
Editors-in-Chief

Volume Preface

This work, which is divided into two volumes, *Environment, Energy and Climate Change I* and *Environment, Energy and Climate Change II*, is a consequence of the *Energy and Environment Knowledge Week* (E2KW) congress that was held in Toledo (Spain) from 20th to 22nd of November 2013 (<http://www.congress.e2kw.es>). This event offered an exceptional opportunity for presenting cutting-edge research in the field of environmental, energy and climate change and illustrating the wide experience on several interesting topics of the contributing authors. The two volumes aim to address some of the key issues facing the environmental problems through interdisciplinary approaches.

Volume 2, which is dedicated to the *Energies from New Resources and the Climate Change*, collects a selection of 11 chapters that deal with several aspects of (clean) production (*conversion*) and *storage* of (clean) energy. The first chapter (from A. Bret) presents an interesting *Global energy balance* that the humanity has to deal with and the *Climate induced possible changes*. The three following chapters (by A. Martin et al., G. San Miguel et al. and S. Martin Martinez et al.) describe methods and technologies used to improve the efficiency of energy capture from photovoltaic solar radiation and wind. The three following papers (from C. de la Cruz et al., M. Abdou-Tankari et al. and M. Karkri et al.) are dedicated to energy storage which is one of the main not already well-solved problems in heterogeneous energetic hybrid systems. Two of these papers study electrical storage; the first one offers a wide overview of possible electrical storage technologies then focuses on batteries or ultracapacitors as main storage components in hybrid systems; the second paper deals with the sizing of hybrid systems involving heterogeneous electrical production and consumption components. The third paper is a bibliographical critical review of the best-known promising ways for storing thermal energy in phase change materials and encapsulating it in order to be usable in the building industry. Three papers are dedicated to the biomass energy; the first one (from J.-C. Dominguez Toribio et al.) tries a difficult review of the technology of biomass conversion into ethanol, processing schemes, production and the pre-treatment methods of bio-products; the second one (from A. Gonzalez del

Campo et al.) studies the influence of external resistance on microbial fuel cell performance which promisingly produces electricity from wastewater; the last paper (from Maria Paz Domínguez et al.) dedicated to biomass presents how avocado seeds and waste could be used for producing fuel. A last paper (from M. Rubio et al.) describes the main socio-economical barriers to efficiency improvement and proposes to break them through learning strategies.

We sincerely thank all authors for their involvement and efforts in preparing their chapters.

Paris, France
Ciudad Real, Spain

Gilles Lefebvre
Elena Jiménez
Beatriz Cabañas

Environment, Energy and Climate Change II
Energies from New Resources and the Climate Change
Lefebvre, G.; Jiménez, E.; Cabañas, B. (Eds.)
2016, XIV, 263 p., Hardcover
ISBN: 978-3-319-17099-2