Edited by Paul T. Anastas

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Green Processes

GREEN CHEMISTRY

Volume 8: Green Nanoscience

Volume Editors:
Alvise Perosa
Maurizio Selva

Handbook of Green Chemistry

Volume 8
Green Nanoscience

Edited by
Alvise Perosa and Maurizio Selva

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About the Editors

Series Editor

Paul T. Anastas joined Yale University as Professor and serves as the Director of the Center for Green Chemistry and Green Engineering there. From 2004–2006, Paul was the Director of the Green Chemistry Institute in Washington, D.C. Until June 2004 he served as Assistant Director for Environment at the White House Office of Science and Technology Policy where his responsibilities included a wide range of environmental science issues including furthering international public-private cooperation in areas of Science for Sustainability such as Green Chemistry. In 1991, he established the industry-government-university partnership Green Chemistry Program, which was expanded to include basic research, and the Presidential Green Chemistry Challenge Awards. He has published and edited several books in the field of Green Chemistry and developed the 12 Principles of Green Chemistry.

Volume Editors

Maurizio Selva earned his Laurea degree (cum Laude) in Industrial Chemistry in 1989, at the Università degli Studi Ca' Foscari Venezia. From 1990 until 1992, Maurizio Selva was first a researcher for the National Council of Research (Italian CNR, research scholarship) and then a grant holder from Tessenderlo Chemie (http://www.tessenderlo.com) at the Department of Environmental Sciences of the Università Ca' Foscari Venezia, where he worked as a research associate. In January 1993, he obtained the position of Assistant Professor of organic chemistry at the same University. In 2000, Maurizio Selva was visiting researcher at the NSF Science Technology Center for Environmentally Responsible Solvents and Processes of the University of North Carolina at Chapel Hill (NC, USA), where he studied synthetic organic methodologies based on dense CO_2 as a solvent. In 2002, he was appointed

Maurizio Selva (on the right) and Alvise Perosa (left) lead the Green Chemistry group at the Department of Molecular Sciences and Nanosystems of the University Ca' Foscari Venezia.

Associate Professor of Organic Chemistry at the University of Venice, Italy, where he is currently working. In the period 1999–2003, Maurizio Selva was Director of the Green Chemistry Laboratory of the Interuniversity Consortium Chemistry for the Environment (http://www.incaweb.org/), at the Scientific and Technological Park "VEGA" in Marghera, Italy. Since 2009, Maurizio Selva is Deputy-coordinator of the Doctoral School in Chemical Sciences at the Università Ca' Foscari Venezia, and scientific advisor for the "Coordinamento Interuniversitario Veneto per le Nanotecnologie" (http://www.civen.org/it/). Major research interests of Maurizio Selva are focussed on eco-friendly methodologies for organic syntheses. Particularly, based on the use of non-toxic compounds belonging to the class of dialkyl carbonates, of compressed CO_2 as a reagent/solvent under batch and continuous-flow conditions, and of ionic liquids as organocatalysts and mediators for multiphase reaction systems. Maurizio Selva is (has been) active as scientific referent also in projects for research and education joint activities in Green Chemistry, funded by the European Social Fund (ESF) through local Government structures (Regione Veneto).

Alvise Perosa graduated in industrial chemistry in 1992 at the Università Ca' Foscari of Venice, Italy. In 1996 he obtained his PhD degree in chemistry as a Fulbright fellow at Case Western Reserve University in Cleveland, USA with Tony Pearson. He returned to Venice as a post-doc, where he got deeply involved with green chemistry

as a researcher and through the European Summer School on Green Chemistry, that he coordinated from 1998 to 2006. His research focus was then mainly on the development of new multiphase catalytic systems for synthesis and for detoxification, and on the use of organic carbonates as green alkylating agents. In 2005 Alvise Perosa obtained the position of "ricercatore" of organic chemistry, *i.e.* assistant professor, at the same university. He sits on the scientific board of the Edizioni Ca' Foscari, on the International Relations Commission of the university, and on the Research Committee of the Department of Molecular Sciences and Nanosystems. Currently Alvise's research focuses on greener synthesis of tailored ionic liquids and on their applications as organocatalysts including mechanism elucidation. Recent focus is on transformations of platform chemicals from biomass using green reagents, towards renewable chemical building blocks. The Green Organic Synthesis Team (GOST) at the Università Ca' Foscari of Venice is run jointly with Maurizio Selva. In 2007 Alvise Perosa was visiting scientist at the University of Sydney as an Endeavour Research Fellow of the Australian Government, where he pursued research and collaborations with Thomas Maschmeyer in the fields of new functional catalytic materials for green transformations and for the upgrade of bio-based chemicals. This collaboration is ongoing through a joint PhD program between Venice and Sydney. As scientific consultant of the Green Oil project in 2011 he set up a pilot-plant scale supercritical carbon dioxide extraction/reaction system applied to the valorization of chemicals from biomass.

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