

Edited by Paul T. Anastas

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Green Processes



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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The Editor

Prof. Dr. Paul T. Anastas

Yale University
Center for Green Chemistry & Green Engineering
225 Prospect Street
New Haven, CT 06520
UAS

Volume Editors

Prof. Dr. Alvise Perosa

Università Ca'Foscari
Dipt. di Scienze Ambientali
Dorsoduro 2137
30123 Venezia
Italy

Prof. Dr. Maurizio Selva

Università Ca'Foscari
Dipt. di Scienze Ambientali
Calle Larga S. Marta 2137
30123 Venezia
Italy

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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 CO₂ as a solvent. In 2002, he was appointed



Maurizio Selva (on the right) and Alvis 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 CO₂ 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).

Alvis 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 Alvisè 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 Alvisè'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 Alvisè 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.

List of Contributors

D. Brad Akers

Clemson University
Chemical and Biomolecular
Engineering
130 Earle Hall
Clemson, SC 29634
USA

Vijai Shankar Balachandran

City College of New York
Department of Chemistry
160 Convent Avenue
New York, NY 10031
USA
and
City University of New York
Graduate School and University Center
of New York
365 Fifth Avenue
New York, NY 10016
USA

Gabriela Calderó

Institute for Advanced Chemistry of
Catalonia
Consejo Superior de Investigaciones
Científicas (IQAC-CSIC) and
CIBER en Bioingeniería, Biomateriales
y Nanomedicina (CIBER-BBN)
C/ Jordi Girona 18–26
08034 Barcelona
Spain

Matteo Cargnello

University of Trieste
Department of Chemical and
Pharmaceutical Sciences
ICCOM-CNR Trieste Research Unit,
Centre of Excellence for Nanostructured
Materials (CENMAT) and INSTM –
Trieste Research Unit
Via L. Giorgieri 1
34127 Trieste
Italy

Jairton Dupont

Universidade Federal do Rio
Grande do Sul (UFRGS)
Institute of Chemistry
Laboratory of Molecular Catalysis
Av. Bento Gonçalves 9500
91501-970 Porto Alegre, RS
Brazil

Paolo Fornasiero

University of Trieste
Department of Chemical and
Pharmaceutical Sciences
ICCOM-CNR Trieste Research Unit,
Centre of Excellence for Nanostructured
Materials (CENMAT) and
INSTM – Trieste Research Unit
Via L. Giorgieri 1
34127 Trieste
Italy

Homer Genuino

University of Connecticut
Department of Chemistry
55 North Eagleville Road
Unit 3060
Storrs, CT 06269
USA

Gabriele Giancane

Università del Salento
Dipartimento di Ingegneria
dell'Innovazione
Via Monteroni
73100 Lecce
Italy

Silvia Giordani

Trinity College Dublin
School of Chemistry and Centre for
Research on Adaptive Nanostructures
and Nanodevices (CRANN)
College Green
Dublin 2
Ireland

Hui Huang

University of Connecticut
Department of Chemistry
55 North Eagleville Road
Unit 3060
Storrs, CT 06269
USA

Kendall M. Hurst

Auburn University
Department of Chemical Engineering
212 Ross Hall
Auburn, AL 36849
USA

Swapnil Rohidas Jadhav

City College of New York
Department of Chemistry
New York, NY 10031
USA

and

City University of New York
Graduate School and University Center
of New York
365 Fifth Avenue
New York, NY 10016
USA

George John

City College of New York
Department of Chemistry
New York, NY 10031
USA

and

City University of New York
Graduate School and University Center
of New York
365 Fifth Avenue
New York, NY 10016
USA

Christopher L. Kitchens

Clemson University
Chemical and Biomolecular
Engineering
130 Earle Hall
Clemson, SC 29634
USA

Thomas Maschmeyer

The University of Sydney
School of Chemistry (F11)
Sydney, NSW 2006
Australia

Anthony F. Masters

The University of Sydney
School of Chemistry (F11)
Sydney, NSW 2006
Australia

Dania Movia

Trinity College Dublin
 School of Chemistry and Centre for
 Research on Adaptive Nanostructures
 and Nanodevices (CRANN)
 College Green
 Dublin 2
 Ireland

Eric Njagi

University of Connecticut
 Department of Chemistry
 55 North Eagleville Road
 Unit 3060
 Storrs, CT 06269
 USA

Alexandre L. Parize

Universidade de Brasília
 Campus Universitário Darcy Ribeiro
 Instituto de Química
 Asa Norte
 70910970 Brasília, DF
 Brazil

Martin H.G. Prechtl

Universidade Federal do Rio
 Grande do Sul (UFRGS)
 Institute of Chemistry
 Laboratory of Molecular Catalysis
 Av. Bento Gonçalves 9500
 91501-970 Porto Alegre, RS
 Brazil

Christopher B. Roberts

Auburn University
 Department of Chemical Engineering
 212 Ross Hall
 Auburn, AL 36849
 USA

Liane M. Rossi

Universidade de São Paulo
 Instituto de Química
 Departamento de Química
 Fundamental
 Av. Prof. Lineu Prestes 748
 Cidade Universitária
 05508-000 São Paulo, SP
 Brazil

Joel C. Rubim

Universidade de Brasília
 Campus Universitário Darcy Ribeiro
 Instituto de Química
 Asa Norte
 70910970 Brasília, DF
 Brazil

Steven R. Saunders

Auburn University
 Department of Chemical Engineering
 212 Ross Hall
 Auburn, AL 36849
 USA

Jackson D. Scholten

Universidade Federal do Rio
 Grande do Sul (UFRGS)
 Institute of Chemistry
 Laboratory of Molecular Catalysis
 Av. Bento Gonçalves 9500
 91501-970 Porto Alegre, RS
 Brazil

Vito Sgobba

Friedrich-Alexander-Universität
 Erlangen
 Department Chemie und Pharmazie
 Egerlandstrasse 3
 91058 Erlangen
 Germany

Conxita Solans

Institute for Advanced Chemistry of
Catalonia
Consejo Superior de Investigaciones
Científicas (IQAC-CSIC) and
CIBER en Bioingeniería, Biomateriales
y Nanomedicina (CIBER-BBN)
C/ Jordi Girona 18–26
08034 Barcelona
Spain

Lisa Stafford

University of Connecticut
Department of Chemistry
55 North Eagleville Road
Unit 3060
Storrs, CT 06269
USA

Steven L. Suib

University of Connecticut
Department of Chemistry
55 North Eagleville Road
Unit 3060
Storrs, CT 06269
USA

and

University of Connecticut
Department of Chemical Engineering
and Institute of Materials Science
191 Auditorium Road
Storrs, CT 06269
USA

Ludovico Valli

Università del Salento
Dipartimento di Ingegneria
dell’Innovazione
Via Monteroni
73100 Lecce
Italy

Gregory Von White II

Clemson University
Chemical and Biomolecular
Engineering
130 Earle Hall
Clemson, SC 29634
USA

Aaron J. Yap

The University of Sydney
School of Chemistry (F11)
Sydney, NSW 2006
Australia

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