Green Chemistry and Sustainable Technology

Aims and Scope

The series *Green Chemistry and Sustainable Technology* aims to present cutting-edge research and important advances in green chemistry, green chemical engineering and sustainable industrial technology. The scope of coverage includes (but is not limited to):

- Environmentally benign chemical synthesis and processes (green catalysis, green solvents and reagents, atom-economy synthetic methods etc.)
- Green chemicals and energy produced from renewable resources (biomass, carbon dioxide etc.)
- Novel materials and technologies for energy production and storage (bio-fuels and bioenergies, hydrogen, fuel cells, solar cells, lithium-ion batteries etc.)
- Green chemical engineering processes (process integration, materials diversity, energy saving, waste minimization, efficient separation processes etc.)
- Green technologies for environmental sustainability (carbon dioxide capture, waste and harmful chemicals treatment, pollution prevention, environmental redemption etc.)

The series *Green Chemistry and Sustainable Technology* is intended to provide an accessible reference resource for postgraduate students, academic researchers and industrial professionals who are interested in green chemistry and technologies for sustainable development.

More information about this series at http://www.springer.com/series/11661

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Sustainable Membrane Technology for Water and Wastewater Treatment

Springer

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Preface

Membrane operations find application in all industrial sectors and have been proved to well compete with conventional production/separation systems. There are already different fields that successfully adopt membrane units, like dialysis, sea and brackish water desalination, and municipal wastewater treatment. However, the need for a sustainable development has imposed new targets to be reached in near future, such as a reduced use of energy and raw materials and lower admissible limits for contaminants discharged into the environment. In this context, the aim of the book is to analyze the sustainability of membrane operations applied at industrial scale, as well as that of those under investigation at lab/pilot scale. It covers not only technical and environmental issues in membrane technology but also economic, regulatory and policy aspects, addressing the challenges for future research in membrane field. The first few chapters of the book deal with sustainability indicators, Life Cycle Assessment (LCA), and process intensification applied to membrane operations. Then, the preparation step of both polymeric and inorganic membranes is presented and discussed, stressing on the possibility of using more sustainable materials, solvents, and processes in the membrane fabrication. As industrial membrane operations, reverse osmosis in desalination, membrane bioreactors for municipal wastewater treatment, and pressure-driven wastewater treatment in agrofood and textile industries are analyzed from a sustainable point of view. Concerning the membrane processes still at a lab/pilot scale, the analysis is made for the: (i) recovery of valuable compounds from wastewater streams, (ii) removal of toxic compounds from water/wastewater, (iii) approaching the zero liquid discharge in desalination.

The book was prepared by leading international researchers (membranologists) having extensive experiences in water and wastewater treatment. We would like to express them our sincere thanks for their contribution and support. We are also very grateful to Prof. Pietro Tundo at Università di Venezia who gave us the possibility of making this book within the series “Green Chemistry and Sustainable

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Rende (CS), Italy

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