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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Enzymatic Polymerization towards Green Polymer Chemistry

Springer

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Preface

Since the middle of the last century, we human beings have enjoyed the industrialized modern society abundant in various products for everyday life, which was realized mainly by the advances of science and technology. We could obtain energy and/or the products very cheaply through utilization of fossil resources. To the end of the last century, however, we have been forced to worry about the global environment; typically, big disasters such as hurricane, typhoon, and heavy rains became to happen more often than before, which is supposed to be owing to the rapid climate change because of the earth warming. This was pointed out to be due partly to the increase of the carbon dioxide emission via energy production from fossil resources like coal and petroleum. COP3 (Kyoto, 1997) was an epoch-making international conference on this problem. From the new century, this movement has been strengthened; COP21 (Paris, 2015) discussed on the problem, and many countries agreed with its importance. To maintain sustainable society, we should increase the use of renewable resources in place of diminishing fossil resources, for mitigating the carbon dioxide emission. Conducting these activities meets with the "carbon-neutral" concept.

In accord with this movement, the concept of "green chemistry" was proposed at the end of the last century in the chemistry field. In producing chemical products, chemists are expected to contribute to reduce the environmental problems. Springer Co. is in the plan of publishing series: "Green Chemistry and Sustainable Technology." Then, we, polymer chemists, should contribute to the polymer chemistry field. For the production of polymer materials, the new method of polymer synthesis "enzymatic polymerization" was created for conducting "green polymer chemistry": the present editors were invited to edit the book *Enzymatic Polymerization towards Green Polymer Chemistry* in the context of the series.

This book has been edited to describe comprehensively the current status of enzymatic polymerization with an explanation of its importance, and to cotribute to realize environmentally desirable earth as well as to maintain sustainable society in the future, hopefully still having global economic growth. Thus, we organized 12 chapters and invited the authors of the respective chapters; all of them have been very active for research in the field worldwide. This book is dedicated to the readers

who are undergraduate/graduate students and chemistry researchers in academia as well as industry fields. We suppose all of them are eager to study and/or to know about enzymatic polymerization, green polymer chemistry, and practical applications for polymer materials productions via green processes.

We believe all the chapters are informative and stimulating to the readers who are pursuing the research not only in the enzymatic polymerization-related area but also in the interdisciplinary areas.

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