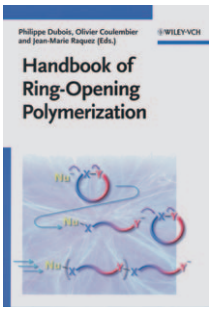

Handbook of Ring-Opening Polymerization
Edited by Philippe Dubois, Olivier Coulembier and Jean-Marie Raquez. Wiley-VCH, Weinheim 2009. 408 pp., hardcover € 149.00.—ISBN 978-3527319534

Handbook of Ring-Opening Polymerization

Ring-opening polymerization (ROP) has become widely used in polymer synthesis and is nowadays a significant part of the macromolecular engineering toolbox. It is also the primary route to some economically important polymers such as polyesters, polyethers, polyamides, and polysiloxanes. Although ring-opening polymerizations have been the subject of many excellent reviews, monographs, and books, various new reaction pathways have been investigated in recent years, and these pave the way for the design of new materials with tunable properties. Indeed, the use of ROP can result in significant control over molecular weight and molecular-weight distribution, and can also provide polymers with chain-end functionality that allows for a variety of post-polymerization reactions, leading to polymers and copolymers with various topologies. Thus, ROP continues to be one of the most vibrant research areas in polymer chemistry, from both academic and industrial points of view.

This book provides an overview of many aspects of ROP, including recent developments such as metal-free catalysis in ROP and enzyme-mediated ROP. It has been written by a team of authors who are familiar with this research area and have wide expertise.

The first part of the book, devoted to the thermodynamics and kinetics of ROP (Chapter 1) and to the general mechanisms of ROP (Chapter 2), covers the theory and fundamentals of the ROP process. Some selected particular cases such as the thermodynamics of ROP in heterogeneous systems, kinetics of specific side reactions, and free-radical-initiated ROP are included, providing an up-to-date description of the fundamentals of the process.

Having gained a basic knowledge of the process, the reader is now fully armed for the second part of the book, which includes chapters on various aspects of the ROP of specific classes of heterocyclic monomers: cyclosiloxanes (Chapter 3), cyclic phosphazenes, thiophosphazenes, and thionylphosphazenes (Chapter 4), cyclic depsipeptides, ureas, and urethanes (Chapter 5), cyclic ethers (including ethylene oxide) and oxazolines (Chapter 6), lactams (Chapter 7), lactones (Chapters 9–11), and cyclic carbonates (Chapter 12). Ring-opening metathesis polymerization (ROMP) of cyclic olefins and ROP of cycloalkanes are specifically addressed in Chapters 8 and 13, respectively. All these chapters include many useful examples from the recent literature, which represent the current state of the art, while also pointing to important new trends in the field.

The third part of the book is devoted to recent advances such as metal-free catalysis in ROP (Chapter 14, polymerization mediated by organocatalysts, including N-heterocyclic carbenes) and enzyme-mediated ROP (Chapter 15). These topics are also discussed specifically for ROP of lactones in the corresponding chapters (Chapter 9 and 10).

In summary, this book edited by key researchers in the field gives considerable insight into the fundamentals and reaction mechanisms of ROP. The index provides cross-referencing to link themes from different chapters. This book will certainly prove useful for every researcher working in the field of ring-opening polymerization, as well as for teachers and students.

Laurent Fontaine
UCO2M, UMR CNRS 6011, Université du Maine
Le Mans (France)

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