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Ionic Liquids

Greener Solvents for Sustainable Chemistry

Synthesis Lectures on Sustainable Development

Series Editor

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This series publishes short books related to sustainable development practices relevant to engineers, technologists, managers, educators, and policy makers. The books are organized around the United Nations Sustainable Development Goals for 2015–2030. Design for sustainability along with the economics of sustainable development will be the common themes for each book. Topics to be covered will span all the major engineering disciplines along with the natural and environmental sciences that contribute to an understanding of sustainable development. The goal of this series is to make theory and research accessible to practitioners working on sustainable development efforts.

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Chemistry

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Preface

Ionic liquids have become a more environmentally friendly class of solvents in recent years, providing an alternative to conventional volatile organic compounds (VOCs). These ion-based liquids have special qualities that make them perfect for a variety of sustainable chemical applications. Ionic liquids have demonstrated great promise in lowering the environmental impact of chemical processes, from catalysis and synthesis to energy storage and environmental remediation.

With topics including the principles of ionic liquid chemistry, green synthesis techniques, and numerous applications, the book *Ionic Liquids—Greener Solvents for Sustainable Chemistry* seeks to give readers a thorough understanding of the discipline. Each of the book's four chapters focusses on a distinct facet of ionic liquids.

Chapter 1 introduces the basics of ionic liquid chemistry, including their structure, properties, classification, synthesis, and characterization. Chapter 2 explores green synthesis methods, highlighting the use of ionic liquids in catalytic reactions, organic synthesis, biocatalysis, and photochemical and electrochemical synthesis. Chapter 3 delves into the applications of ionic liquids, showcasing their potential in pharmaceutical and fine chemical synthesis, biomass conversion, energy storage and conversion, and environmental remediation. Finally, Chap. 4 discusses emerging trends and opportunities, including ionic liquid-based nanocatalysis, sustainable energy applications, biodegradable ionic liquids, and future directions in ionic liquid research.

Researchers, students, and professionals interested in sustainable chemistry and green technologies in the domains of chemistry, materials science, and engineering are the target audience for this book. We believe that anyone interested in learning more about how ionic liquids could contribute to a more sustainable future will find this book to be a useful resource.

We hope that readers will find this book informative, engaging, and inspiring, and that it will motivate them to explore the exciting world of ionic liquids.

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