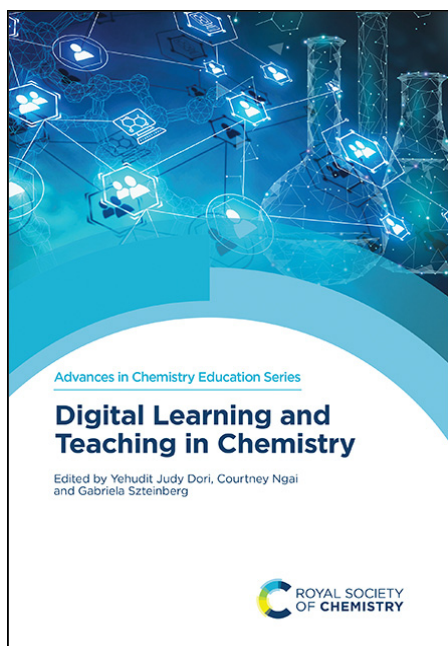


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## Digital Learning and Teaching in Chemistry

**Yehudit Dori** Technion – Israel Institute of Technology, Israel

**Courtney Ngai** Colorado State University, USA

**Gabriela Szeinberg** Washington University in St. Louis, USA

### Synopsis

Education is always evolving, and most recently has shifted to increased online or remote learning. This book compiles the established and emerging trends in this field, specifically within the context of learning and teaching in chemistry.

### Brief Contents

- What We Know and What We Wish to Investigate Further
- Supportive Aspects of Online Learning and Teaching
- Adapting Large Intro-level Chemistry Courses to Fully Remote or Hybrid
- Personalized Support for Students Learning Chemistry Online
- A Framework for Learning to Teach Chemistry on a Digital Platform
- Learning with Digital Media About the Recycling of Digital Hardware
- Chemistry-based Information in Social Media
- Digital Platforms for Increasing Inclusion in Chemistry Education
- Group Diversity and Innovative Thinking
- Integrating Web-based Learning for High School Students
- The Next Level in Inclusive Chemistry Education
- Can YouTubers Provide Tools to Address Heterogeneity?
- A Conceptual Model-based Approach for Systems Thinking
- Chemistry Teachers' Awareness of Sustainability Through Social Media
- Using Visualization and Laboratory to Promote Learning in Science
- Applications of Digital Technology in Chemical Education
- Designing Virtual Chemistry Visualizations
- Designing Tutorial Videos to Support Learning of Reaction Mechanisms
- Digital Tools for Equitable in Person and Remote Chemistry Learning
- Smartphone Applications as a Catalyst for Active Learning in Chemistry
- The Community of Inquiry Framework
- Digital Formative Assessments for Learning
- Online Assignments
- The Impact of Muddiest Point Activities on Student Learning Outcomes
- Embedding Feedback in Digital Learning Environments
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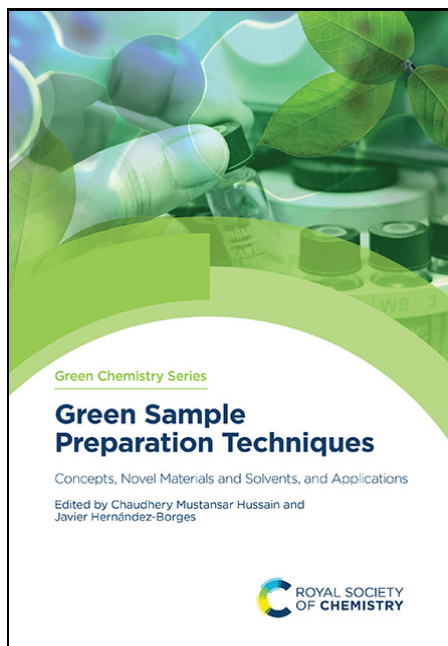
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## Green Sample Preparation Techniques Concepts, Novel Materials and Solvents, and Applications

**Chaudhery Mustansar Hussain** New Jersey Institute of Technology, USA  
**Javier Hernandez-Borges** Universidad de La Laguna, Spain

### Synopsis

There is a trend towards development of eco-friendly methods of sample preparation without loss of efficiency. This book provides a general, critical and updated vision of the different green sample preparation approaches that have been developed including miniaturisation of the extraction techniques, the use of greener solvents, such as certain ionic liquids (ILs), instead of conventional organic solvents and the use of new selective sorbent materials which allow both extraction and clean-up in the same step. Advanced undergraduate and graduate students will find this book a useful reference source and it is tailored for a broad audience including chemists, materials scientists, biologists and chemical engineers.

### Brief Contents

- Introduction to Green Sample Preparation
- Miniaturization and Automation in Green Sample Preparation
- Metal- and Covalent–Organic Frameworks in Green Sample Preparation
- Carbonaceous Materials in Green Sample Preparation
- Molecularly Imprinted Polymers in Green Sample Preparation
- Natural Sorbents in Green Sample Preparation
- Ionic Liquids in Green Sample Preparation
- Deep Eutectic Solvents (DESs) in Green Sample Preparation
- Supramolecular Solvents (SUPRASs) in Green Sample Preparation
- Switchable Hydrophilicity Solvents (SHS) in Green Sample Preparation
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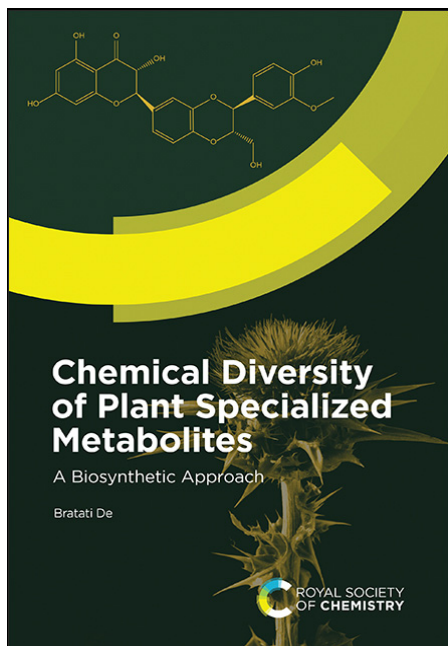
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## Chemical Diversity of Plant Specialized Metabolites Biosynthetic Approach

Bratati De University of Calcutta, India

### Synopsis

The phytochemical constituents of plants fall into two main categories based on their role in basic metabolic processes: primary and secondary. Primary metabolites are involved in basic life functions and are similar in all living cells whereas secondary metabolites (also called secondary products and natural products) are derived from subsidiary pathways and are not directly involved in the normal growth, development, or reproduction of an organism. Historically, these secondary metabolites are the main factor in the study and use of 'medicinal' plants and herbals, as well as in nutrition and food chemistry. In modern medicine these secondary metabolites provide many of the lead compounds in the production of medicines targeted at treating a broad variety of diseases. Secondary metabolites are classified according to their chemical structures and this book will present the different classes of metabolites in turn while discussing their sources and distribution in plant families, their biosynthetic pathways, and their important and notable uses in phytochemistry and pharmacology. This book will be a useful guide and reference point for chemists and students in many disciplines including synthetic organic chemists, medicinal chemists, pharmacognocists, chemical ecologists, bioengineers, and synthetic biologists in addition to those working in related fields.

### Brief Contents

- Introduction
- Carbohydrates and Glycosides
- Acetate-malonate Pathway: Fatty Acids and Polyketides
- Mevalonate and Methylerythritol Phosphate Pathway: Terpenoids and Steroids
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