
Aqueous Microwave Assisted Chemistry Synthesis And Catalysis Rsc Green Chemistry

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2023-02-05

VALENCIA NIXON

Practical Microwave Synthesis for Organic Chemists Springer Science & Business Media

The use of alternative energy forms and transfer mechanisms is one of the key approaches of process intensification. In recent years, significant amounts of research have been carried out in developing chemical processing technologies enhanced by plasma, electric and magnetic fields, electromagnetic and ultra-sound waves and high gravity fields. Discussing the broad impact of alternative energy transfer technologies on reactions, separations and materials synthesis, this book reports on recent breakthrough results in various application areas. It provides a comprehensive overview of the current developments in the field. The book enables industrialists, academics and postgraduates in alternative-energy based processing to see the potential of alternative energies for green chemistry and sustainability of chemical manufacturing.

Microwave-Assisted Polymerization BoD - Books on Demand

Tailored to the needs of medicinal and natural products chemists, the second edition of this unique handbook brings the contents up to speed, almost doubling the amount of chemical information with an additional volume. As in the predecessor, a short introductory section covers the theoretical background and evaluates currently available instrumentation and equipment. The main part of the book then goes on to systematically survey the complete range of published microwave-assisted synthesis methods from their beginnings in the 1990s to mid-2011, drawing on data from more than 5,000 reports and publications. Throughout, the focus is on those reactions, reagents and reaction conditions that work, and that are the most relevant for medicinal and natural products chemistry. A much expanded section is devoted to combinatorial, highthroughput and flow chemistry methods.

Green Techniques for Organic Synthesis and Medicinal Chemistry John Wiley & Sons

Thiazole, or 1,3-thiazole, is a five-member heterocyclic compound that contains a sulfur atom and a nitrogen atom. The term "thiazoles" also refers to a large family of molecules containing one or more thiazole rings. The design and synthesis of novel thiazole derivatives as anti-cancer agents has been

the focal point of recent research, in great part because of their biological properties and their applications in drug development. In Thiazole: Synthesis and Reactions, an attempt is made to review the reports of recent research advances in the area of aqueous phase synthesis of thiazoles and benzothiazoles, particularly those published in the last decade. In closing, the authors showcase the recent research advances in thiazole/benzothiazole synthesis involving microwave irradiation

Microwave Assisted Organic Synthesis CRC Press

This book presents important developments and applications of green chemistry, especially in the field of organic chemistry. The chapters give a brief account of green organic reactions in water, green organic reactions using microwave and in solvent-free conditions. In depth discussions on the green aspects of ionic liquids, flow reactions, and recoverable catalysts are provided in this book. An exclusive chapter devoted to green Lewis acid is also included. The potential of supercritical fluids as green solvents in various areas of organic reactions is explained as well. This book will be a valuable reference for beginners as well as advanced researchers interested in green organic chemistry.

Green Chemistry John Wiley & Sons

This book presents the applications of ion-exchange materials in the area of environmental analysis and treatment. It includes chapters on applications of organic, inorganic and composite ion exchange materials and hexacyanoferrates in various fields such as chemical and biochemical separations, water purification, removal of harmful impurities, dyes and cationic and anionic complexes. This title is a highly valuable source of knowledge on ion-exchange materials and their applications suitable for postgraduate students and researchers but also to industrial R&D specialists in chemistry, chemical, and biochemical technology. Additionally, this book will provide an in-depth knowledge of ion-exchange column and operations suitable for engineers and industrialists.

Carbon in Earth's Interior Springer

The demands for green and sustainable synthetic methods in the fields of healthcare and fine chemicals, combined with the pressure to produce these substances expeditiously and in an environmentally benign fashion, pose significant challenges to the synthetic chemical community. Green chemistry can avoid pollution by utilizing techniques that are environmentally friendly by

design and one of the best green techniques is the use of microwave (MW) assisted aqueous synthetic protocols. Fusing MW technique with water (as a benign reaction medium) can offer an extraordinary synergistic effect with greater potential than these two individual components in isolation. Selective microwave heating can be exploited to develop a high yield protocol and the use of water expedites the MW-protocol with more energy efficiency. This book provides an overview of the various processes developed using aqueous microwave chemistry and is written for chemists, chemical engineers and researchers in the early stages who want to develop sustainable and green processes. Written by well known microwave experts, the book is a comprehensive examination of the field and is the first book that deals strictly with aqueous microwave chemistry and represents a significant effort towards green chemistry. It covers all the microwave-assisted aqueous reactions in depth, including heterocycle synthesis, metal catalysis, enzyme catalysis, polymer synthesis, nanomaterials synthesis and nano-catalysis. Each chapter contains representative experimental procedures, helping the reader quickly replicate some of the experiments to gain hands-on experience.

Multicomponent Reactions Royal Society of Chemistry

The large-scale production of chemicals to meet various societal needs has created environmental pollution, including pollution from byproducts and improper disposal of waste. With the world facing adverse consequences due to this pollution, green chemistry is increasingly being viewed as a means to address this concern. Since most organic syntheses

Colloidal Quantum Dot Optoelectronics and Photovoltaics John Wiley & Sons

In the last 10 years organic dyes, traditionally used for coloring textiles and other materials, have become increasingly important in the hi-tech industries of electronics and optoelectronics. They can be used in optical data storage, new solar cells and biomedical sensors. Functional Dyes discusses the synthesis of these new, high-value dyes and pigments as well as their applications and performance. The chapters are arranged so that the reader logically advances from the fundamental concepts to more practical aspects of the technology in which they are used. In providing the reader with current information on functional dye chemistry, as well as important developments within the field, Functional Dyes is a valuable information source for dye and material chemists, researchers and graduates, who want a summary of the key advances in the field over the last 10 years and an authoritative view on future developments.* Provides a broad introduction to the science technology of the functional dye application* Reviews recent advances on synthesis and characteristics of the functional dyes and their applications* Is a valuable information source for dye and material chemists and researchers

Applications of Ion Exchange Materials in the Environment CRC Press

The first reports on the application of microwaves in organic synthesis date back to 1986, but it was not until the recent introduction of specifically designed and constructed equipment, which countered the safety and reproducibility concerns, that synthetic application of microwaves has become established as a laboratory technique. Microwave assisted synthesis is now being adopted in many industrial and academic laboratories to take advantage of the novel chemistry that can be carried out using a variety of organic reaction types. This book demonstrates the underlying principles of microwave dielectric heating and, by reference to a range of organic reaction types, its effective use

in synthetic organic chemistry. To illustrate the impact microwave assisted organic synthesis can have on chemical research, case studies drawn mainly from the pharmaceutical industry are presented.

Microwave Processing of Materials John Wiley & Sons

Introduction to microwave acid decomposition; Microwave heating: theoretical concepts and equipment design; Guidelines for developing microwave dissolution methods for geological and metallurgical samples.

Microwave Chemistry Cambridge University Press

Microwaves can be effectively used in the processing of industrial materials under a wide range of conditions. However, microwave processing is complex and multidisciplinary in nature, and a high degree of technical knowledge is needed to determine how, when, and where the technology can be most profitably utilized. This book assesses the potential of microwave technology for industrial applications, reviews the latest equipment and processing methods, and identifies both the gaps in understanding of microwave processing technology and the promising development opportunities that take advantage of this new technology's unique performance characteristics.

New Trends in Green Chemistry John Wiley & Sons

N. Pemberton, E. Chorell, F. Almqvist: Microwave-Assisted Synthesis and Functionalization of 2-Pyridones, 2-Quinolones and other Ring-Fused 2-Pyridones.- M.C. Bagley, M.C. Lubinu: Microwave-Assisted Multicomponent Reactions for the Synthesis of Heterocycles.- T. Besson, V. Thiery: Microwave-Assisted Synthesis of Sulfur and Nitrogen-Containing Heterocycles M. Erdélyi: Solid-Phase Methods for the Microwave-Assisted Synthesis of Heterocycles.- S. Crosignani, B. Linclau: Synthesis of Heterocycles Using Polymer-Supported Reagents under Microwave Irradiation.- B.U.W. Maes: Transition Metal-Based Carbon-Carbon and Carbon-Heteroatom Bond Formation for the Synthesis and Decoration of Heterocycles.- M. Rodriguez and M. Taddei: Synthesis of Heterocycles via Microwave-Assisted Cycloadditions and Cyclocondensations.- N. Kaval, P. Appukkuttan, E. Van der Eycken: The Chemistry of 2-(1H)-Pyrazinones in Solution and on Solid Support

Microwaves in Organic and Medicinal Chemistry Elsevier

Microwave Chemistry has changed the way to work in chemical laboratories and is an established state-of-the-art technology to accelerate and enhance chemical processes. This book not only gives an overview of the technology, its historical development and theoretical background, but also presents its exceptionally broad spectrum of applications. Microwave Chemistry enables graduate students and scientist to learn and apply its methods successfully.

Synthetic Applications Springer Science & Business Media

We are delighted to present this volume with contributions from some of the most renowned and experienced microwave chemists today. The delivery and introduction of energy has been closely connected with the discovery and investigation of new chemistry. It is with pleasure that we have seen an increased use of microwave irradiation over the years and we hope that this volume will reflect the current interest in expanding the scope of microwave applications in both organic and medicinal chemistry. One important explanation behind the growth of microwave-enhanced chemistry has been the introduction of dedicated microwave reactors. As a result of this development we are proud to present a diverse set of - views.

Apart from chapters spanning the scope that is usually associated with microwave methods, such as heterocyclic chemistry - an intriguing, but frustratingly diverse field that is excellently presented in one of the reviews - and transition metal-catalyzed reactions, we also present a review on microwave-assisted natural product chemistry, a topic that is of high interest and neither often nor widely covered. A contribution on microwave-accelerated synthesis of protease inhibitors underlines the usefulness of microwave heating in medicinal chemistry and a review of porous microwave chemistry highlights the importance of the combination of high-speed reactions and quick separations. Two separate chapters on scaled-up microwave reactions and green and sustainable chemistry give an overview of aspects of microwave chemistry that might be of great use in both industrial and small-scale applications. We would like to take this opportunity to express our sincere gratitude to the contributors of this volume for their valuable time and efforts. We believe that the presented work will further promote the use of controlled microwave heating in both academia and industry.

Microwave-Assisted Organic Synthesis John Wiley & Sons

A comprehensive overview covering the principles and preparation of catalysts, as well as reactor technology and applications in the field of organic synthesis, energy production, and environmental catalysis. Edited and authored by renowned and experienced scientists, this reference focuses on successful reaction procedures for applications in industry. Topics include catalyst preparation, the treatment of waste water and air, biomass and waste valorisation, hydrogen production, oil refining as well as organic synthesis in the presence of heterogeneous and homogeneous catalysts and continuous-flow reactions. With its practical relevance and successful methodologies, this is a valuable guide for chemists at universities working in the field of catalysis, organic synthesis, pharmaceutical or green chemistry, as well as researchers and engineers in the chemical industry.

Microwave Methods in Organic Synthesis Walter de Gruyter GmbH & Co KG

Captures the most up-to-date research in the field, written in an accessible style by the world's leading experts.

Comprehensive Organic Chemistry Experiments for the Laboratory Classroom Royal Society of Chemistry

Introduction to Electromagnetic Waves with Maxwell's Equations Discover an innovative and fresh approach to teaching classical electromagnetics at a foundational level Introduction to Electromagnetic Waves with Maxwell's Equations delivers an accessible and practical approach to teaching the well-known topics all electromagnetics instructors must include in their syllabus. Based on the author's decades of experience teaching the subject, the book is carefully tuned to be relevant to an audience of engineering students who have already been exposed to the basic curricula of linear algebra and multivariate calculus. Forming the backbone of the book, Maxwell's equations are developed step-by-step in consecutive chapters, while related electromagnetic phenomena are discussed simultaneously. The author presents accompanying mathematical tools alongside the material provided in the book to assist students with retention and comprehension. The book contains over 100 solved problems and examples with stepwise solutions offered

alongside them. An accompanying website provides readers with additional problems and solutions. Readers will also benefit from the inclusion of: A thorough introduction to preliminary concepts in the field, including scalar and vector fields, cartesian coordinate systems, basic vector operations, orthogonal coordinate systems, and electrostatics, magnetostatics, and electromagnetics An exploration of Gauss's Law, including integral forms, differential forms, and boundary conditions A discussion of Ampere's Law, including integral and differential forms and Stoke's Theorem An examination of Faraday's Law, including integral and differential forms and the Lorentz Force Law Perfect for third- and fourth-year undergraduate students in electrical engineering, mechanical engineering, applied maths, physics, and computer science, Introduction to Electromagnetic Waves with Maxwell's Equations will also earn a place in the libraries of graduate and postgraduate students in any STEM program with applications in electromagnetics.

Alternative Energy Sources for Green Chemistry John Wiley & Sons

Organic chemistry has played a vital role in the development of diverse molecules which are used in medicines, agrochemicals and polymers. Most of the chemicals are produced on an industrial scale. The industrial houses adopt a synthesis for a particular molecule which should be cost-effective. No attention is paid to avoid the release of harmful chemicals in the atmosphere, land and sea. During the past decade special emphasis has been made towards green synthesis which circumvents the above problems. Prof. V. K. Ahluwalia and Dr. M. Kidwai have made a sincere effort in this direction. This book discusses the basic principles of green chemistry incorporating the use of green reagents, green catalysts, phase transfer catalysis, green synthesis using microwaves, ultrasound and biocatalysis in detail. Special emphasis is given to liquid phase reactions and organic synthesis in the solid phase. I must congratulate both the authors for their pioneering efforts to write this book. Careful selection of various topics in the book will serve the rightful purpose for the chemistry community and the industrial houses at all levels. PROF. JAVED IQBAL, PhD, FNA Distinguished Research Scientist & Head Discovery Research Dr. Reddy's Laboratories Ltd.

Microwaves in Catalysis Royal Society of Chemistry

The authors of this guide are experts on the use of microwaves for drug synthesis as well as having much experience in teaching courses held under the auspices of the American Chemical Society and the IUPAC. In this handy source of information for any practicing synthetic chemist they focus on common reaction types in medicinal chemistry, including solid-phase and combinatorial methods. They consider the underlying theory, latest developments in microwave applications and include a variety of examples from recent literature, as well as less common applications that are equally relevant for organic and medicinal chemists. An indispensable reference for researchers with an affinity to modern methods.

Aqueous Microwave Assisted Chemistry John Wiley & Sons

Allowing many chemical reactions to be completed within minutes, microwave heating has revolutionized preparative chemistry. As a result, this technology has been widely adopted in both academic and industrial laboratories. Integrating microwave-assisted chemistry into undergraduate laboratory courses enables students to perform a broader range of