

Organic Chemistry I Chemtech

This book will formally launch "organic synthesis engineering" as a distinctive field in the armory of the reaction engineer. Its main theme revolves around two developments: catalysis and the role of process intensification in enhancing overall productivity. E becoming increasingly useful in organic synthesis engineering, especially in the production of medium and small volume chemicals and enhancing reaction rates by extending laboratory techniques, such as ultrasound, phase transfer catalysts, membrane reac industrial scale production. This volume describes the applications of catalysis in organic synthesis and outlines different techniques of reaction rate and/or selectivity enhancement against a background of reaction engineering principles for both homogeneous and heterogeneous catalysis. This book provides a comprehensive, step-by-step approach to organic process research and development in the pharmaceutical, fine chemical, and agricultural chemical industries. Process R&D describes the steps taken, following synthesis and evaluation, to bring a new product to market in a cost-effective manner. More people are being hired for work in this area as increasing numbers of drug candidates are identified through combinatorial chemistry and high-throughput screening. The book is directed to industrial (primarily organic) scientists and academicians (particularly those involved in a growing number of start-up companies) and students who need insight into industrial process R&D. Current books do not describe hands-on, step-by-step, approaches to solving process development problems, i solvent selection; optimising catalytic reactions; chiral syntheses; and "green chemistry." "Practical Process Research and Development" will be a valuable resource for researchers, managers, and graduate students. Provides insights into generating rugged, p processes for the chemical preparation of "small molecules" Breaks down process optimization into route, reagent and solvent selection, development of reaction conditions, workup, crystallizations and more Includes over 100 tips for rapid process development implementing and troubleshooting processes

Recent years have seen huge growth in the area of sustainable chemistry. In order to meet the chemical needs of the global population whilst minimising impacts on health and the environment it is essential to keep reconsidering and improving synthetic pr Synthesis is a comprehensive collection of contributions, provided by specialists in Green Chemistry, covering topics ranging from catalytic approaches to benign and alternative reaction media, and innovative and more efficient technologies.

This latest version of Information Resources in Toxicology (IRT) continues a tradition established in 1982 with the publication of the first edition in presenting an extensive itemization, review, and commentary on the information infrastructure of the field. T ranging, international, annotated bibliography and compendium of major resources in toxicology and allied fields such as environmental and occupational health, chemical safety, and risk assessment. Thoroughly updated, the current edition analyzes technolog with online tools and links to Web sites. IRT-IV is highly structured, providing easy access to its information. Among the 'hot topics covered are Disaster Preparedness and Management, Nanotechnology, Omics, the Precautionary Principle, Risk Assessment, a Radioactive Terrorism and Warfare are among the designated.
• International in scope, with contributions from over 30 countries
• Numerous key references and relevant Web links
• Concise narratives about toxicologic sub-disciplines
• Valuable appendices

Glossary of Terms in Toxicology
• Authored by experts in their respective sub-disciplines within toxicology

Raw Materials
• Processes
• Products

Who's who in Technology Today

A Guide to Functional Group Preparations

Natural Organic Matter in Water

A Comprehensive Guide to Principles, Products and Protocols

Handbook of Green Chemistry and Technology

This greatly-expanded new edition of a best-selling guide offers an encyclopedic and systematic collection of useful synthetic methodology, including tens of thousands of reactions and synthetic transformations. Covers and cross references so practicing chemists can easily navigate through the book's comprehensive coverage of reagents and reactions Updates and expands a best-selling guide through the year 2011 "...the book is undoubtedly still of great value and every chemist working in the area of synthesis should have it within reach in the laboratory." —Angewandte Chemie review of the 2nd edition "...an indispensable reference work for designing and carrying out modern organic chemical synthesis.... It is amazing that so much information is contained in a single volume that is arranged in a logical and easy to use fashion." —Analytical Biochemistry review of the 2nd edition

Chemical industries have to face the challenge of finding adequate processes to produce large quantities of new products, while at the same time decreasing both the impact on the environment and the risk of disaster. This book addresses this challenge. It discusses the problems of environmentally benign organic processes on an interdisciplinary approach. The book features experts in selective catalysis, development of new reagents and methods who present their recent results.

This volume covers the use of modern solvent systems for the performance of more efficient, selective and economical organic transformations. During the last 20 years, water has emerged as a new useful reaction media for the performance of organic or metal catalyzed reactions. More recently, other reaction media such as perfluorinated solvents or supercritical CO2 have proven their utility for many organic syntheses as well as in combinatorial chemistry. The most representative industrial applications of some of these modern solvent systems are described, and the synthetic possibilites of performing organic reactions in the absence of solvents examined.

Organic accelerators of vulcanization. Theories of vulcanization.

Introduction to Industrial Chemistry

Industrial Organic Chemistry

Information Resources in Toxicology

Systematic Survey of Rubber Chemistry

Microwave Chemistry

Bibliography of Bibliographies on Chemistry and Chemical Technology, 1900-1924

Publisher Description

Advances in Catalysis

Aromatic organic hydrocarbons and heterocycles represent a bulk of about one third of all industrially produced organic basic materials. Aromatic compounds such as benzene, phenol, naphthalene, anthracene, and their homologues, are derived from raw materials, coal, crude oil and biogenic resources by thermal and catalytic refining processes. This book introduces the chemistry of aromatics with a brief discussion of the aromatic character and a survey of historical aspects, particularly the development of the organic dye industry during the 19th century. The main emphasis of the book is to give a clear prospect of industrial processes for the production and the derivatisation of aromatics with consistent flow diagrams. Economical aspects of by- and side-products are especially regarded. For the most important aromatics an analysis of the international market included their derivatives: polymers, pesticides, dyes, pigments and drugs. Professional scientists, managers and students in chemistry and chemical engineering will find a wealth of information for their career and daily work.

Advances in Microwave Chemistry discusses the novel bond formation methodologies, synergistic effects of microwaves with other entities, sample preparation including digestion, combustion, and extraction techniques, as well as selectivity in chemical processes. Recent updates are provided on microwave-assisted syntheses of pharmacologically significant aza-, oxo- and other heterocycles, including lactams, nucleosides, bile acids and sterols, the preparation of nanomaterials, composites, and absorber layer materials for thin film. This book also incorporates comparative discussions involving microwave irradiation with conventional methods in different aspects of organic, inorganic, medicinal, and green chemistry. Key Features: Provides a comparative discussion on microwave irradiation with conventional methods in different aspects of organic, inorganic, medicinal, and green chemistry Presents recent applications of microwave radiation in biocatalysis Offers a complete package correlating various aspects of microwaves in organic syntheses, the biological impact of products formed in reactions, pharmacological features, and environmental sustainability of the procedures Explains microwave-induced reactions on structurally complex bile acids and sterols Stands as a valuable and unique addition to the well-established book series, New Directions in Organic and Biological Chemistry

Mechanistic Principles and Synthetic Methodology Including Biochemical Processes

Principles of Organometallic Chemistry

A Bibliography, with Copious Abstracts, of the Entire Literature of Rubber Chemistry and Closely Allied Subjects; Thoroughly Indexed by Authors and Subjects, and Completely Cross-referenced; Together with a Patent Index, and Introductory Chapters

Summarizing the Present Status of Rubber Chemistry

General and Synthetic Methods

Advances in Microwave Chemistry

East European Accessions Index

'Ideal for getting an overview of applied organic chemistry' This bestselling standard, now in its 3rd completely revised English edition, is an excellent source of technological and economic information on the most important precursors and intermediates used in the chemical industry. Right and left columns containing synopsis of the main text and statistical data, and numerous fold-out flow diagrams ensure optimal didactic presentation of complex chemical processes. The translation into eight languages, the four German and three English editions clearly evidence the popularity of this book. "... it is where I look first to get a quick overview of the manufacturing process of a product... Weissermel/Arpe has been serving me for years as an indispensable reference work.' (Berichte der Bunsengesellschaft f ü r Physikalische Chemie) 'Whether student or scientist, theorist or practician - everybody interested in industrial organic chemistry will appreciate this work.' (farbe + lack) "...it should be ready to hand to every chemist or process engineer envolved directly or indirectly with industrial organic chemistry . It should be in the hand of every higher-graduate student, especially if chemical technology is not part of the study, like in many college universities..." (Tenside-Surfactants-Detergents)

The outlook of organic synthesis has changed many times during its tractable history. The initial focus on the synthesis of substances typical of living matter, exemplified by the first examples of organic chemistry through the synthesis of urea from inorganic substances by Liebig, was accepted as the birth of organic chemistry, and thus also of organic synthesis. Although the early developments in organic synthesis closely followed the pursuit of molecules typical in nature, towards the end of the 19th century, societal pressures placed higher demands on chemical methods appropriate for the emerging age of industrialization. This led to vast amounts of information being generated through the discovery of synthetic reactions, spectroscopic techniques and reaction mechanisms. The basic organic functional group transformations were discovered and improved during the early part of this century. Reaction mechanisms were elucidated at a growing pace, and extremely powerful spectroscopic tools, such as infrared, nuclear magnetic resonance and mass spectrometry were introduced as everyday tools for a practising organic chemist. By the 1950s, many practitioners were ready to agree that almost every molecule could be syn thesized. Some difficult stereochemical problems were exceptions; for example Woodward concluded that erythromycin was a "hopelessly complex target". This frustration led to a hectic phase of development of new and increasingly more ingenious protecting group strategies and functional group transformations, and also saw the emergence of asymmetric synthesis.

The new time-saving revolution in drug discovery. Combinatorial chemistry, a method for synthesizing millions of chemical compounds much faster than usual, is becoming one of the most useful technical tools available to chemists and researchers working today. Using current advances in computer and laboratory techniques, combinatorial chemistry has freed professionals from the drudgery of piecemeal experimental work and opened new creative possibilities for experimentation. Combinatorial Chemistry: Synthesis and Application details critical aspects of the technique, featuring the work of some of the world's leading chemists, many of whom played a key role in its development. Including examples of both solution-phase and solid-phase approaches as well as the full complement of organic chemistry technologies currently available, the book describes:
* Concepts and terms of combinatorial chemistry
* Polymer-supported synthesis of organic compounds
* Macro beads as microreactors
* Solid-phase methods in combinatorial chemistry
* Encoded combinatorial libraries, including RF-encoding of synthesis beads
* Strategies for combinatorial libraries of oligosaccharides
* Combinatorial libraries of peptides, proteins, and antibodies using biological systems. While combinatorial chemistry originated in peptide chemistry, this volume has deliberately focused on nonpeptide organic applications, illustrating the technique's wide uses. Combinatorial Chemistry introduces organic, medicinal, and pharmaceutical chemists as well as biochemists to this exciting, cost-effective, and practical technique, which has unlocked creative potential for the next millennium.

"One noted scientist explained his refusal to contribute a volume by saying, in part, that "it is extraordinarily difficult to write in good taste about oneself. Only if one can manage a humorous and light touch does it come off well. Naturally, I would like to place my work in what I consider its true scientific perspective, but..." "Each autobiography reflects the author's science, his lifestyle, and the style of his research. Naturally, the volumes are not uniform, although each author attempted to follow the guidelines. "To write in good taste" was not an objective of the series. On the contrary, the authors were specifically requested not to write a review article of their field, but to detail their own research accomplishments. To the extent that this instruction was followed and the result is not "in good taste", then these are criticisms that I, as editor, must bear, not the writer." "As in any project, I have a few regrets. It is truly sad that Egbert Havinga, who wrote this volume, and David Ginsburg, who translated another, died during the development of this project. There have been many rewards, some of which are documented in my personal account of this project, entitled "Extracting the Essence:

Adventures of an Editor" published in CHEMTECH."--BOOK JACKET.

Comprehensive Organic Transformations, 4 Volume Set

Enzymatic Reactions in Organic Media

Women in Chemistry

Their Changing Roles from Alchemical Times to the Mid-twentieth Century

Industrial Organic Chemicals

Problem-Solving Exercises in Green and Sustainable Chemistry

Reflecting the growing volume of published work in this field, researchers will find this book an invaluable source of information on current methods and applications.

This monograph contains manuscripts, poster abstracts and summary statements representing the contributions of a group of scientists who participated in the sixth annual Texas A&M Industry-University Cooperative Chemistry Program (IUCCP) at Texas A&M University in College Station, Texas, March 22-24, 1988. This symposium on "Functional Polymers" was organized by a university-industrial steering committee consisting of Dr. D. Keene, Hoechst Celanese; Dr. D. E. McLemore, Dow Chemical Company; Dr. B. Frushour, Monsanto Company; Dr. S. Corley, Shell Development; Dr. F. Hoffstadt, BPAmerica; Dr. D. E. Bergbreiter, Texas A&M University; Dr. C. A. J. Hoeve, Texas A&M University; Dr. C. R. Martin, Texas A&M University; Dr. A. Clearfield, Texas A&M University; and Dr. A. E. Martell, Texas A&M University. The symposium itself was generously supported by the industrial companies participating in the IUCCP program. These sponsoring chemical companies include; Shell Development Company, Dow Chemical Company, BPAmerica, Monsato Company and Hoechst Celanese. The choice of "Functional Polymers" as the subject for this symposium reflects the rapid developments occurring in the broad field of polymer science and the potential for using polymeric derivatives in many new exciting and potentially profitable applications. The invited papers and submitted posters reflect the diversity of this field and include many different topics ranging from biomedical applications of polymers to conducting polymers to use of polymers as lithographic masks and recording media. General topics included in the symposium were: photoresponsive polymers, polymer blends, electronically conductive polymers, polymers catalysts, biomedical polymers and membrane transport and permeability.

Advanced ChemTech Handbook of Combinatorial and Solid Phase Organic ChemistryA Comprehensive Guide to Principles, Products and ProtocolsAdvanced ChemtechIndustrial Organic ChemistryJohn Wiley & Sons

Approximately 77 percent of the freshwater used in the United States comes from surface-water sources and is subject to natural organic matter contamination according to the United States Geological Survey. This presents a distinct challenge to water treatment engineers. An essential resource to the latest breakthroughs in the characterization, treatment and removal of natural organic matter (NOM) from drinking water, Natural Organic Matter in Waters: Characterization and Treatment Methods focuses on advance filtration and treatment options, and processes for reducing disinfection byproducts. Based on the author's years of research and field experience, this book begins with the characterization of NOM including: general parameters, isolation and concentration, fractionation, composition and structural analysis and biological testing. This is followed by removal methods such as inorganic coagulants, polyelectrolytes and composite coagulants. Electrochemical and membranes removal methods such as: electrocoagulation, electrochemical oxidation, microfiltration and ultrafiltration, nanofiltration and membrane fouling. Covers conventional as well as advanced NOM removal methods Includes characterization methods of NOM Explains removal methods such as: removal by coagulation, electrochemical, advanced oxidation, and integrated methods

Synthesis and Application

Hydrocarbon Chemistry

Metal-Catalyzed Oxidations of Organic Compounds

Tools and Strategies

High Throughput Screening

Interest in green chemistry and clean processes has grown so much in recent years that topics such as fluorous biphasic catalysis, metal organic frameworks, and process intensification, which were barely mentioned in the First Edition, have become major areas of research. In addition, government funding has ramped up the development of fuel cells and biofuels. This reflects the evolving focus from pollution remediation to pollution prevention. Copiously illustrated with more than 800 figures, the Third Edition provides an update from the frontiers of the field. It features supplementary exercises at the end of each chapter relevant to the chemical examples introduced in each chapter. Particular attention is paid to a new concluding chapter on the use of green metrics as an objective tool to demonstrate proof of synthesis plan efficiency and to identify where further improvements can be made through fully worked examples relevant to the chemical industry. NEW AND EXPANDED RESEARCH TOPICS Metal-organic frameworks Metrics Solid acids for alkylation of isobutene by butanes Carbon molecular sieves Mixed micro- and mesoporous solids Organocatalysis Process intensification and gas phase enzymatic reactions Hydrogen storage for fuel cells Reactive Catalysts in action on an atomic scale UPDATED AND EXPANDED CURRENT EVENTS TOPICS Industry resistance to inherently safer chemistry Nuclear power Removal of mercury from vaccines Removal of mercury and lead from primary explosives Biofuels Uses for surplus glycerol New hard materials to reduce wear Electronic waste Smart growth The book covers traditional green chemistry topics, including catalysis, benign solvents, and alternative feedstocks. It also discusses relevant but less frequently covered topics with chapters such as "Chemistry of Long Wear" and "Population and the Environment." This coverage highlights the importance of chemistry to everyday life and demonstrates the benefits the expanded exploitation of green chemistry can have for society.

Furnishing the latest interdisciplinary information on the most important and frequently the only investigational system available for discovery programs that address the effects of small molecules on newly discovered enzyme and receptor targets emanating from molecular biology, this timely resource facilitates the transition from classical to high throughput screening (HTS) systems and provides a solid foundation for the implementation and development of HTS in bio-based industries and associated academic environments.

The importance of industrial chemistry Chemistry is a challenging and interesting subject for academic study. Its principles and ideas are used to produce the chemicals from which all manner of materials and eventually consumer products are manufactured. The diversity of examples is enormous, ranging from cement to iron and steel, and on to modern plastics which are so widely used in the packaging of consumer goods and in the manufacture of household items. Indeed life as we know it today could not exist without the chemical industry. Its contribution to the saving of lives and relief of suffering is immeasurable; synthetic drugs such as those which lower blood pressure (e. g. /3-blockers), attack bacterial and viral infections (e. g. antibiotics such as the penicillins and cephalosporins) and replace vital natural chemicals which the body is not producing due to some malfunction (e. g. insulin, some vitamins), are particularly noteworthy in this respect. Effect chemicals also clearly make an impact on our everyday lives. Two examples are the use of polytetrafluoroethylene (polytetrafluoroethene Teflon or Fluon) to provide a non-stick surface coating for cooking utensils, and silicones which are used to ease the discharge of bread from baking tins. It should also be noted that the chemical industry's activities have an influence on all other industries, either in terms of providing raw materials or chemicals for quality control analyses and to improve operation, and to treat boiler water, cooling water and effluents.

This book provides an unparalleled contemporary assessment of hydrocarbon chemistry – presenting basic concepts, current research, and future applications.
• Comprehensive and updated review and discussion of the field of hydrocarbon chemistry
• Includes literature coverage since the publication of the previous edition
• Expands or adds coverage of: carboxylation, sustainable hydrocarbons, extraterrestrial hydrocarbons
• Addresses a topic of special relevance in contemporary science, since hydrocarbons play a role as a possible replacement for coal, petroleum oil, and natural gas as well as their environmentally safe use
• Reviews of prior edition: "...literature coverage is comprehensive and ideal for quickly reviewing specific topics...of most value to industrial chemists..." (Angewandte Chemie) and "...useful for chemical engineers as well as engineers in the chemical and petrochemical industries." (Petroleum Science and Technology)

The Discovery of Bioactive Substances

Functional Polymers
Advances in Catalysis
Free Energy Relationships in Organic and Bio-Organic Chemistry
Organic Chemistry: The Name Game
Sustainable Organic Synthesis

Metal-Catalyzed Oxidations of Organic Compounds: Mechanistic Principles and Synthetic focuses on the oxidative transformations of functional groups. This book explores oxidation as being extensively used in the laboratory synthesis of fine organic chemicals and in the manufacture of large-volume petrochemicals. Organized into two parts encompassing 13 chapters, this book starts with an overview of the mechanistic principles of oxidation-reduction in biochemical, organic, and inorganic systems. This text then proceeds with a discussion of the use of molecular oxygen, hydrogen peroxide, and alkyl hydroperoxides as primary oxidants. Other chapters explore stoichiometric oxidations with metal oxidants, which include permanganate and chromic acid. This book discusses as well the synthetic applications of catalytic oxidations as well as the technology of petrochemical oxidation. The final chapter deals with the autoxidations of sulfur, phosphorus, and nitrogen compounds. This book is intended for chemists involved in organic synthesis, catalysis, and organometallic chemistry, both in academic institutions and in industrial laboratories.

In the nearly 10 years since the publication of the bestselling first edition of Introduction to Green Chemistry, interest in green chemistry and clean processes has grown so much that topics, such as fluoros biphasic catalysis, metal organic frameworks, and process intensification, barely mentioned in the first edition, have become major areas of research. In addition, government funding has ramped up the development of fuel cells and biofuels. It reflects the evolving focus from pollution remediation to pollution prevention. Copiously illustrated with over 800 figures, this second edition provides an update from the frontiers of the field. New and expanded research topics: Metal-organic frameworks Solid acids for alkylation of isobutene by butanes Carbon molecular sieves Mixed micro- and mesoporous solids Organocatalysis Process intensification and gas phase enzymatic reactions Hydrogen storage for fuel cells Reactive distillation Catalysts in action on an atomic scale Updated and expanded current events topics: Industry resistance to inherently safer chemistry Nuclear power Removal of mercury from vaccines Removal of mercury and lead from primary explosives Biofuels Uses for surplus glycerol New hard materials to reduce wear Electronic waste Smart growth The book covers traditional green chemistry topics, including catalysis, benign solvents, and alternative feedstocks. It also discusses relevant but less frequently covered topics with chapters such as Chemistry of Longer Wear and Population and the Environment. This coverage highlights the importance of chemistry to everyday life and demonstrates the benefits the expanded exploitation of green chemistry can have for society.

Discusses the lives and scientific contributions of more than fifty women chemists from antiquity through the present day.

Introducing the application of free energy correlations to elucidating the mechanisms of organic and bio-organic reactions, this book provides a new and illuminating way of approaching a potentially complex topic. The idea of how free energy correlations derive from polar substituent change is introduced, and common pitfalls encountered in the application of free energy relationships are described, along with the use of these anomalies in mechanistic studies. The concept of effective charge is described in detail, with examples of its application. Throughout, worked answers are provided for the problems posed. Databases of parameters, an extensive bibliography and comprehensive lists of further reading are also included. The text provides an invaluable source of information to senior undergraduates, postgraduates and to industrial researchers with an interest in mechanistic studies. It is the first such book in more than thirty years.

Practical Process Research and Development

Advanced ChemTech Handbook of Combinatorial and Solid Phase Organic Chemistry

Characterization and Treatment Methods

Enantioselective Reactions in Organic Chemistry

Enjoying Organic Chemistry, 1927-1987

Combinatorial Chemistry

Sustainable development is now accepted as a necessary goal for achieving societal, economic and environmental objectives. Within this chemistry has a vital role to play. The chemical industry is successful but traditionally success has come at a heavy cost to the environment. The challenge for chemists and others is to develop new products, processes and services that achieve societal, economic and environmental benefits. This requires an approach that reduces the materials and energy intensity of chemical processes and products; minimises the dispersion of harmful chemicals in the environment; maximises the use of renewable resources and extends the durability and recyclability of products in a way that increases industrial competitiveness as well as improve its tarnished image.

Organic Chemistry: The Name Game: Modern Coined Terms and their Origins is a lighthearted take on the usually difficult and systematic nomenclature found in organic chemistry. However, despite the lightheartedness, the book does not lose its purpose, which is to serve as a source of information on this particular subject of organic chemistry. The book, arranged into themes, discusses some organic compounds and how they are named based on their structure, makeup, and components. The text also explains the use of Greek and Latin prefixes in nomenclature and many other principles in nomenclature. The book also includes an appendix that contains very useful information on nomenclature, such as the etymology of certain element and chemical names, numerical prefixes, and the Greek alphabet. The text is not only for students who wish to be familiarized with a different style of organic chemistry nomenclature, but also for professors who aim to give students an enjoyable yet memorable learning experience.

Written to help the student chemist clarify the career areas and technical problems which are to be considered when chemical reactions are carried out on a large scale. Covers the research and development of consumer products based on chemical processes. Topics covered include the chemical industry and large-scale chemical manufacturing, inorganic and fermentation processes, the conversion of petroleum into purified chemical substances, and the environmental impact of these and other processes.

Microwave Chemistry has changed the way to work in chemical laboratories and is an established state-of-the-art technology to accelarate 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.

Modern Coined Terms and Their Origins

Solvents and Solvent Effects in Organic Chemistry

Industrial Aromatic Chemistry

Introduction to Green Chemistry

Modern Solvents in Organic Synthesis

Organic Synthesis Engineering

Now in its 4th edition, this book remains the ultimate reference for all questions regarding solvents and solvent effects in organic chemistry. Retaining its proven concept, there is no other book which covers the subject in so much depth, the handbook is completely updated and contains 15% more content, including new chapters on "Solvents and Green chemistry",

"Classification of Solvents by their Environmental Impact", and "Ionic Liquids". An essential part of every organic chemist's library.

When confronted with a problem in science, the way to proceed is not always obvious. The problem may seem intractable or there may be many possible solutions, with some better than others.

Problem-Solving Exercises in Green and Sustainable Chemistry teaches students how to analyze and solve real-world problems that occur in an environmental context, and it encourages creativity in developing solutions to situations based on events that have actually taken place. The problems described in this book are relevant and stimulating in learning and understanding the principles of green and sustainable chemistry. They address various aspects of the field, including: Toxicity Waste generation and disposal Chemical accidents Energy efficiency New policy development The final chapter contains proposed solutions to the presented problems and provides commentaries and references to relevant literature. This book also prompts students to become more comfortable with the idea of multiple "correct" answers to problems. It emphasizes the reality that green chemistry is about making practical decisions and weighing multiple factors that are often conflicting, thus making it difficult or impossible to apply one perfect solution to a given situation. Problem-Solving Exercises in Green and Sustainable Chemistry prepares students to solve challenging problems, whether as green chemists, as architects designing energy-efficient buildings, or as environmentally-conscious citizens.

Introduction to Green Chemistry, Second Edition

New Methodologies and Techniques for a Sustainable Organic Chemistry

an introduction to Industrial Chemistry