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This book provides both neuroscientists and architects with methods of organizing research that would help us understand human experiences in architectural settings.

What’s it really like to be a chemist? Leading chemists share what they do, how they do it, and why they love it. “Letters to a young ” has been a much-loved way for professionals in a field to convey their enthusiasm and the realities of what they do to the next generation. Now, Letters to a Young Chemist does the same for the chemical sciences. Written with a humorous touch by some of today’s leading chemists, this book presents missives to “Angela,” a fictional undergraduate considering a career in chemistry. The different chapters offer a mix of fundamental principles, contemporary issues, and challenges for the future. Marye Anne Fox, Chancellor of the University of California San Diego, talks about learning to do research and modern physical organic chemistry. Brothers Jonathan and Daniel Sessler explain the chemistry of anesthetics that make modern surgery possible while Elizabeth Nolan talks about biological imaging. Terry Collins talks about green chemistry, a more sustainable way of doing chemistry, while several authors including Carl Wamser, Harry Gray, John Magyar, and Penny Brothers discuss the crucial contributions that chemists can make in meeting global energy needs. Letters to a Young Chemist gives students and professionals alike a unique window into the real world of chemistry. Entertaining, informative, and full of honest and inspiring advice, it serves as a helpful guide throughout your education and career. “The different chapters describe both the wonders of the molecular world and the practical benefits afforded by chemistry and if any girl out there thinks that chemistry is a man’s world, this book should be a good antidote.” —Marye Anne Fox, Chancellor of the University of California, San Diego, and winner of the 2009 US National Medal of Science “Letters to a Young Chemist offers significant ammunition for motivating young people to consider chemistry as a career. This book should also be required reading for all faculty members who teach chemistry in high schools, colleges, and universities.” —Stephen J. Lippard, Arthur Amos Noyes Professor of Chemistry, Massachusetts Institute of Technology, and winner of the 2006 US National Medal of Science

Functional oxides have a wide variety of applications in the electronic industry. The discovery of new metal oxides with interesting and useful properties continues to drive much research in chemistry, physics, and materials science. In Functional Oxides five topical areas have been selected to illustrate the importance of metal oxides in modern materials chemistry: Noncentrosymmetric Inorganic Oxide Materials Geometrically Frustrated Magnetic Materials Lithium Ion Conduction in Oxides Thermoelectric Oxides Transition Metal Oxides - Magnetoresistance and Half-Metallicity The contents highlight structural chemistry, magnetic and electronic properties, ionic conduction and other emerging areas of importance, such as thermoelectricity and spintronics. Functional Oxides covers these complex concepts in a clear and accessible manner providing an excellent introduction to this broad subject area.

"This book will combine photographs with evocative text to show how chemistry underpins the formation of snowflakes, the patterns of animal

markings, and much more"--

William Crookes' long life was one of unbroken scientific and business activity, culminating in his appointment as President of the Royal Society in 1913. Throughout his career he was an important science journalist, the discoverer of thallium, the inventor of the radiometer, investigator of cathode rays and the vacuum, a spectroscopist of significance in rare earth chemistry, and a spokesman for a chemical solution to the problems with the world's food supplies. He was also, and perhaps most controversially, an occultist who played a significant role in spiritualism in the 1870s, and was involved with D.D. Home (Browning's Mr Sludge) and other notable mediums of the day. Previous literature on Crookes has tended to focus on his involvement with the spiritualists, sometimes to the detriment of his many scientific achievements. This, the first biography of William Crookes, gives us the whole man: one of the most complex, public, and interesting figures in the history of science. Professor Brock guides us through the abundant catalogue of Crookes' accomplishments, placing his scientific activities in the context of the business of making a living from science - something that Crookes did principally as a science journalist and editor with his Chemical News (the model for today's Nature), and by business enterprises ranging from water analysis, sewerage schemes, and goldmining to the design of electric light bulbs. We also see Crookes in the lab, as an independent researcher, and learn the processes behind his discovery of thallium, his investigations into matter and energy, and his crucial work on cathode rays. We see the public man, the celebrity who was much sought after for his opinions on the latest discovery, and who was widely regarded as Britain's leading scientist at the beginning of the twentieth century. Scientist, spiritualist, entrepreneur: Sir William Crookes' extraordinary life and many endeavours provide a unique window into Victorian and Edwardian science and industry.

Shortlisted for the 2020 AAAS/Subaru SB&F Prize for Excellence in Science Books Creating an element is no easy feat. It's the equivalent of firing six trillion bullets a second at a needle in a haystack, hoping the bullet and needle somehow fuse together, then catching it in less than a thousandth of a second – after which it's gone forever. Welcome to the world of the superheavy elements: a realm where scientists use giant machines and spend years trying to make a single atom of mysterious artefacts that have never existed on Earth. From the first elements past uranium and their role in the atomic bomb to the latest discoveries stretching our chemical world, Superheavy will reveal the hidden stories lurking at the edges of the periodic table. Why did the US Air Force fly planes into mushroom clouds? Who won the transfermium wars? How did an earthquake help give Japan its first element? And what happened when Superman almost spilled nuclear secrets? In a globe-trotting adventure that stretches from the United States to Russia, Sweden to Australia, Superheavy is your guide to the amazing science filling in the missing pieces of the periodic table. By the end you'll not only marvel at how nuclear science has changed our lives – you'll wonder where it's going to take us in the future.

Advances in Stem Cells and Their Niches addresses stem cells during development, homeostasis, and disease/injury of the respective organs, presenting new developments in the field, including new data on disease and clinical applications. Video content illustrates such areas as protocols, transplantation techniques, and work with mice. Explores not only reviews of research, but also shares methods, protocols, and transplantation techniques Contains video content to illustrate such areas as protocols, transplantation techniques, and work with mice Each volume concentrates on one organ, making this a unique publication

Imagine living in 1958, and knowing that the integrated circuit--the microchip--was about to be invented, and would revolutionize the world. Or imagine 1992, when the Internet was about to transform virtually every aspect of our lives. Incredibly, this book argues that we stand at such a moment right now--and not just in one field, but in many. In 2030, authors Rutger van Santen, Djan Khoe, and Bram Vermeer interview over two dozen scientific and technological experts on themes of health, sustainability and communication, asking them to look forward to the year 2030 and comment on the kind of research that will play a necessary role. If we know what technology will be imperative in 2030, the authors reason, what can we do now to influence future breakthroughs? Despite working in dissimilar fields, the experts called upon in the book - including Hans Blix (Head of the UN investigation in Iraq), Craig Venter (explorer of the human DNA), and Susan Greenfield (a leading world authority on the human brain), among many others - all emphasize the interconnectedness of our global networks in technology and communication, so tightly knit that the world's major conflicts are never isolated incidents. A fresh understanding of the regularities underlying these complex systems is more important than ever. Using bright, accessible language to discuss topics of universal interest and relevance, 2030 takes the position that we can, in fact, influence the course of history. It offers a new way of looking forward, a fresh perspective on sustainability, stability and crisis-prevention. For

anyone interested in modern science, this book will showcase the technologies that will soon change the way we live.

Carbohydrate chemistry provides access to carbohydrate-based natural products and synthetic molecules as useful biologically active structures relevant to many health care and disease-related biological processes. Recent Trends in Carbohydrate Chemistry: Synthesis, Structure, and Function of Carbohydrates covers green and sustainable reactions, organometallic carbohydrate chemistry, synthesis of glycomimetics, multicomponent reactions, and chemical transformations leading to molecular diversity based on carbohydrates. These include inhibitors of glycogen phosphorylase, which are relevant in controlling type 2 diabetes and sugar sulfates. Polysaccharides, which are commonly modified chemically, are also examined with contributions covering polysaccharide synthesis and modification of polysaccharides to obtain new structures and properties. Recent Trends in Carbohydrate Chemistry: Synthesis, Structure, and Function of Carbohydrates is ideal for researchers working as synthetic organic chemists, and for those interested in biomolecular chemistry, green chemistry, organometallic chemistry, and material chemistry in academia as well as in industry.

Research in science education has recognized the importance of history and philosophy of science (HPS). Nature of science (NOS) is considered to be an essential part of HPS with important implications for teaching science. The role played by textbooks in developing students' informed conceptions of NOS has been a source of considerable interest for science educators. In some parts of the world, textbooks become the curriculum and determine to a great extent what is taught and learned in the classroom. Given this background and interest, this monograph has evaluated NOS in university level general chemistry textbooks published in U.S.A. Most textbooks in this study provided little insight with respect to the nine criteria used for evaluating NOS. Some of the textbooks, however, inevitably refer to HPS and thus provide guidelines for future textbooks. A few of the textbooks go into considerable detail to present the atomic models of Dalton, Thomson, Rutherford, Bohr and wave mechanical to illustrate the tentative nature of scientific theories --- an important NOS aspect. These results lead to the question: Are we teaching science as practiced by scientists? An answer to this question can help us to understand the importance of NOS, by providing students an HPS-based environment, so that they too (just like the scientists) feel the thrill and excitement of discovering new things. This monograph provides students and teachers guidelines for introducing various aspects of NOS, based on historical episodes.

Introduction to the subject of materials technology for students of Community Colleges.

In Cathedrals of Science, Patrick Coffey describes how chemistry got its modern footing-how thirteen brilliant men and one woman struggled with the laws of the universe and with each other. They wanted to discover how the world worked, but they also wanted credit for making those discoveries, and their personalities often affected how that credit was assigned. Gilbert Lewis, for example, could be reclusive and resentful, and his enmity with Walther Nernst may have cost him the Nobel Prize; Irving Langmuir, gregarious and charming, "rediscovered" Lewis's theory of the chemical bond and received much of the credit for it. Langmuir's personality smoothed his path to the Nobel Prize over Lewis. Coffey deals with moral and societal issues as well. These same scientists were the first to be seen by their countries as military assets. Fritz Haber, dubbed the "father of chemical warfare," pioneered the use of poison gas in World War I-vividly described-and Glenn Seaborg and Harold Urey were leaders in World War II's Manhattan Project; Urey and Linus Pauling worked for nuclear disarmament after the war. Science was not always fair, and many were excluded. The Nazis pushed Jewish scientists like Haber from their posts in the 1930s. Anti-Semitism was also a force in American chemistry, and few women were allowed in; Pauling, for example, used his influence to cut off the funding and block the publications of his rival, Dorothy Wrinch. Cathedrals of Science paints a colorful portrait of the building of modern chemistry from the late 19th to the mid-20th century.

Can we emulate nature's technology in chemistry? Through billions of years of evolution, Nature has generated some remarkable systems and substances that have made life on earth what it is today. Increasingly, scientists are seeking to mimic Nature's systems and processes in the lab in order to harness the power of Nature for the benefit of society. Bioinspiration and Biomimicry in Chemistry explores the chemistry of Nature and how we can replicate what Nature does in abiological settings. Specifically, the book focuses on wholly artificial, man-made systems that employ or are inspired by principles of Nature, but which do not use materials of biological origin. Beginning with a general overview of the concept of bioinspiration and biomimicry in chemistry, the book tackles such topics as: Bioinspired molecular machines Bioinspired catalysis Biomimetic amphiphiles and vesicles Biomimetic principles in macromolecular science Biomimetic cavities and bioinspired receptors Biomimicry in organic

synthesis Written by a team of leading international experts, the contributed chapters collectively lay the groundwork for a new generation of environmentally friendly and sustainable materials, pharmaceuticals, and technologies. Readers will discover the latest advances in our ability to replicate natural systems and materials as well as the many impediments that remain, proving how much we still need to learn about how Nature works. Bioinspiration and Biomimicry in Chemistry is recommended for students and researchers in all realms of chemistry. Addressing how scientists are working to reverse engineer Nature in all areas of chemical research, the book is designed to stimulate new discussion and research in this exciting and promising field.

This textbook introduces the industrial production and processing of natural resources. It is divided into six major topics (fats and oils, carbohydrates, lignin, terpenoids, other natural products, biorefinery), which are divided into a total of 20 chapters. Each chapter is self-contained and therefore a compact learning unit, which can be worked on by students in self-study or presented by lecturers. Clear illustrations, flow diagrams, apparatus drawings and photos facilitate the understanding of the subject matter. All chapters end with a succinct summary, the "Take Home Messages". Each chapter is supplemented by ten short test questions, which can be solved quickly after working through the chapter; the answers are at the end of the book. All chapters contain bibliographical references that focus on essential textbooks and reference works. As a prior knowledge, only basic knowledge of chemistry is required.

The tobacco plant synthesizes nicotine to protect itself from herbivores. The female moth broadcasts sex pheromones to attract a mate, while a soldier ant deploys an alarm pheromone to call for help. The carbon dioxide on a mammal's breath beckons hungry ticks and mosquitoes, while a flower's fragrance speaks to the honey bee. Indeed, much of the communication that occurs within and between various species of organisms is done not by sight, sound, or touch, but with chemicals. From mating to parenting, foraging to self-defense, plant and animal activities are accomplished largely by the secretion or exchange of organic chemicals. The fascinating and fast-developing science that encompasses these diverse phenomena is introduced here, by William Agosta, in a series of remarkable stories absolutely accessible to the general reader yet revelatory to chemists and biologists. Among Agosta's characters are the organisms that steal, counterfeit, or interpret the chemical signals of other species for their own ends. We learn of seeds that mimic ant odors to facilitate their own dispersion and flies that follow the scent of truffles to lay their eggs. We read about pit vipers that react in terror when their flicking tongues detect a king snake, and slave-making ants incapable of finding their own food. And we meet ice-age people who ate birch fungus to relieve whipworms and early human hunters who used the urine of wolves to maneuver deer to favorable sites. Agosta also chronicles the rapid development of the applied science that makes use of chemical ecology. As researchers deepen our understanding of the biological world, they are making economically significant discoveries (such as enzymes that remain stable in extreme heat), finding ways to reduce our reliance on manufactured pesticides, identifying new uses for traditional medicines, and developing sophisticated new pharmaceuticals effective in treating malaria and several cancers. On the horizon are antiviral agents derived from the chemical defenses of marine species. From the exploits of flies to the high-stakes effort to cure human disease, Agosta's tour of chemical ecology grants any reader entrance to the invisible realm where chemistry determines life and death.

Biomineralization is a hot topic in the area of materials, and this volume in the Metals Ions in Life Sciences series takes a systematic approach, dealing with all aspects from the fundamentals to applications. Key biological features of biomineralization, such as gene directed growth and the role of enzymes are covered, as are new areas, including copper/zinc in the jaws of invertebrates or magnetic biomaterials that help birds with navigation

General Chemistry for Engineers explores the key areas of chemistry needed for engineers. This book develops material from the basics to more advanced areas in a systematic fashion. As the material is presented, case studies relevant to engineering are included that demonstrate the strong link between chemistry and the various areas of engineering. Serves as a unique chemistry reference source for professional engineers Provides the chemistry principles required by various engineering disciplines Begins with an 'atoms first' approach, building from the simple to the more complex chemical concepts Includes engineering case studies connecting chemical principles to solving actual engineering problems Links chemistry to contemporary issues related to the interface between chemistry and engineering practices

Research on metal clusters (compounds with metal-metal bonds) has undergone explosive growth and the subject is now perhaps one of the

hottest'' topics in organometallic chemistry. The prospect of catalytic applications has motivated a large part of the research mentioned in this book - the long term goal being to exploit the unique properties of metal clusters to prepare catalysts with new activities and selectivities. This is the first book to address the role of metal clusters in catalysis. The coverage is up-to-date and is particularly comprehensive, ranging from molecular chemistry of clusters (synthesis, structure, thermochemistry, reactivity, and homogeneous catalysis) to supported clusters (molecular analogues on polymers, and metal oxides and metals in zeolite cages). Preparation by methods of organometallic surface chemistry and metal atom chemistry and characterization of surface structures by physical methods are highlighted. Concepts unifying metal cluster chemistry and the chemistry of metal surfaces are elucidated. Of particular value to the user will be the cluster and subject indexes. The cluster index is organized in alphabetical order according to the metal.

Nature-Inspired Computing: Physics and Chemistry-Based Algorithms provides a comprehensive introduction to the methodologies and algorithms in nature-inspired computing, with an emphasis on applications to real-life engineering problems. The research interest for Nature-inspired Computing has grown considerably exploring different phenomena observed in nature and basic principles of physics, chemistry, and biology. The discipline has reached a mature stage and the field has been well-established. This endeavour is another attempt at investigation into various computational schemes inspired from nature, which are presented in this book with the development of a suitable framework and industrial applications. Designed for senior undergraduates, postgraduates, research students, and professionals, the book is written at a comprehensible level for students who have some basic knowledge of calculus and differential equations, and some exposure to optimization theory. Due to the focus on search and optimization, the book is also appropriate for electrical, control, civil, industrial and manufacturing engineering, business, and economics students, as well as those in computer and information sciences. With the mathematical and programming references and applications in each chapter, the book is self-contained, and can also serve as a reference for researchers and scientists in the fields of system science, natural computing, and optimization.

Discusses the reckless annihilation of fish and birds by the use of pesticides and warns of the possible genetic effects on humans.

This book deals with functional materials that are in the frontiers of current materials science and technology research, development and manufacture. The first of its kind, it deals with three classes of materials, (1) magnetic semiconductors, (2) multiferroics, and (3) graphene. Because of the wide popularity of these materials there is a strong need for a book about these materials for graduate students, new researchers in science and technology, as well as experienced scientists and technologists, technology based companies and government institutes for science and technology. The book will provide this broad audience with both theoretical and experimental understanding to help in technological advances in the development of devices and related new technologies based on these very interesting and novel materials. Covers both the theoretical and experimental aspects of advanced functional materials, which are important for use in a number of rapidly developing novel technological devices Includes excellent coverage of three of the leading advanced functional materials Edited by a leading expert at the forefront of advanced functional materials research

The features of chemistry that make it such a fascinating and engaging subject to teach also contribute to it being a challenging subject for many learners. Chemistry draws upon a wide range of abstract concepts, which are embedded in a large body of theoretical knowledge. As a science, chemistry offers ideas that are the products of scientists' creative imaginations, and yet which are motivated and constrained by observations of natural phenomena. Chemistry is often discussed and taught largely in terms of non-observable theoretical entities - such as molecules and electrons and orbitals - which probably seem as familiar and real to a chemistry teacher as Bunsen burners: and, yet, comprise a realm as alien and strange to many students as some learners' own alternative conceptions ('misconceptions') may appear to the teacher. All chemistry teachers know that chemistry is a conceptual subject, especially at the upper end of secondary school and at university level, and that some students struggle to understand many chemical ideas. This book offers a step-by-step analysis and discussion of just why some students find chemistry difficult, by examining the nature of chemistry concepts, and how they are communicated and learnt. The book considers the idea of concepts itself; draws upon case studies of how canonical chemical concepts have developed; explores how chemical concepts become represented in curriculum and in classroom teaching; and discusses how conceptual learning and development occurs. This book will be invaluable to anyone interested in teaching

and learning and offers guidance to teachers looking to make sense of, and respond to, the challenges of teaching chemistry.

Although numerical data are, in principle, universal, the compilations presented in this book are extensively annotated and interleaved with text. This translation of the second German edition has been prepared to facilitate the use of this work, with all its valuable detail, by the large community of English-speaking scientists. Translation has also provided an opportunity to correct and revise the text, and to update the nomenclature. Fortunately, spectroscopic data and their relationship with structure do not change much with time so one can predict that this book will, for a long period of time, continue to be very useful to organic chemists involved in the identification of organic compounds or the elucidation of their structure. Klaus Biemann Cambridge, MA, April 1983 Preface to the First German Edition Making use of the information provided by various spectroscopic tech niques has become a matter of routine for the analytically oriented organic chemist. Those who have graduated recently received extensive training in these techniques as part of the curriculum while their older colleagues learned to use these methods by necessity. One can, therefore, assume that chemists are well versed in the proper choice of the methods suitable for the solution of a particular problem and to translate the experimental data into structural information.

"this substantial and engaging text offers a wealth of practical (in every sense of the word) adviceEvery undergraduate laboratory, and, ideally, every undergraduate chemist, should have a copy of what is by some distance the best book I have seen on safety in the undergraduate laboratory." Chemistry World, March 2011 Laboratory Safety for Chemistry Students is uniquely designed to accompany students throughout their four-year undergraduate education and beyond, progressively teaching them the skills and knowledge they need to learn their science and stay safe while working in any lab. This new principles-based approach treats lab safety as a distinct, essential discipline of chemistry, enabling you to instill and sustain a culture of safety among students. As students progress through the text, they'll learn about laboratory and chemical hazards, about routes of exposure, about ways to manage these hazards, and about handling common laboratory emergencies. Most importantly, they'll learn that it is very possible to safely use hazardous chemicals in the laboratory by applying safety principles that prevent and minimize exposures. Continuously Reinforces and Builds Safety Knowledge and Safety Culture Each of the book's eight chapters is organized into three tiers of sections, with a variety of topics suited to beginning, intermediate, and advanced course levels. This enables your students to gather relevant safety information as they advance in their lab work. In some cases, individual topics are presented more than once, progressively building knowledge with new information that's appropriate at different levels. A Better, Easier Way to Teach and Learn Lab Safety We all know that safety is of the utmost importance; however, instructors continue to struggle with finding ways to incorporate safety into their curricula. Laboratory Safety for Chemistry Students is the ideal solution: Each section can be treated as a pre-lab assignment, enabling you to easily incorporate lab safety into all your lab courses without building in additional teaching time. Sections begin with a preview, a quote, and a brief description of a laboratory incident that illustrates the importance of the topic. References at the end of each section guide your students to the latest print and web resources. Students will also find "Chemical Connections" that illustrate how chemical principles apply to laboratory safety and "Special Topics" that amplify certain sections by exploring additional, relevant safety issues. Visit the companion site at http://userpages.wittenberg.edu/dfinster/LSCS/.

Reproduction of the original: The Sceptical Chymist by Robert Boyle

A fascinating look at the treatment of depression, blending journalism, science, history, and memoir, by an award-winning science writer. What is depression? Is it a persistent low mood or a complex range of symptoms? Is it a single diagnosis or a diversity of mental disorders requiring different treatments? In A Cure for Darkness, science writer Alex Riley explores these questions, digging into the long history of depression and chronicling the lives of psychiatrists and scientists who sought cures for their patients. Since 2015, Riley has received both cognitive behavioral therapy and antidepressants for his own depression. Throughout his treatment, he wondered--are antidepressants effective? Do short-term talking therapies actually work? And what treatments are on the horizon for those who don't respond to these first-line treatments? Expanding from his own experience, he tracks treatments through history, from the "talking cure" to electroconvulsive therapy to magic mushrooms. With depression fast becoming the leading burden of disease around the world, the future of mental healthcare depends not just on the development of new therapies, but on increasing access for people who are currently without. Reporting on the field of global mental health from its colonial past to the present day, Riley highlights a range of scalable therapies, including how a group of grandmothers stands on the frontline of a mental health

revolution. Weaving in personal and family history, A Cure for Darkness is a gripping narrative journey and a surprisingly hopeful work that delves deep into the science of mental health.

In A Tale of Seven Elements, Eric Scerri presents the fascinating history of those seven elements discovered to be mysteriously "missing" from the periodic table in 1913.

One of 2021's Most Highly Anticipated New Books--Newsweek One of The 20 New Leadership Books--Adam Grant One The Best New Wellness Books Hitting Shelves In January--Shape.com A Next Big Idea Club Nominee Social Chemistry will utterly transform the way you think about "networking." Understanding the contours of your social network can dramatically enhance personal relationships, work life, and even your global impact. Are you an Expansionist, a Broker, or a Convener? The answer matters more than you think. . . . Yale professor Marissa King shows how anyone can build more meaningful and productive relationships based on insights from neuroscience, psychology, and network analytics. Conventional wisdom says it's the size of your network that matters, but social science research has proven there is more to it. King explains that the quality and structure of our relationships has the greatest impact on our personal and professional lives. As she shows, there are three basic types of networks, so readers can see the role they are already playing: Expansionist, Broker, or Convener. This network decoder enables readers to own their network style and modify it for better alignment with their life plans and values. High-quality connections in your social network strongly predict cognitive functioning, emotional resilience, and satisfaction at work. A well-structured network is likely to boost the quality of your ideas, as well as your pay. Beyond the office, social connections are the lifeblood of our health and happiness. The compiled results from dozens of previous studies found that our social relationships have an effect on our likelihood of dying prematurely--equivalent to obesity or smoking. Rich stories of Expansionists like Vernon Jordan, Brokers like Yo-Yo Ma, and Conveners like Anna Wintour, as well as personal experiences from King's own world of connections, inform this warm, engaging, revelatory investigation into some of the most consequential decisions we can make about the trajectory of our lives.

A sweeping history of the discovery of the world's first antibiotic, sulfa, and its seminal influence on the fields of medicine and science looks at key figures in the battle against disease, how sulfa changed the way in which doctors treated patients, and how it transformed how new drugs are developed, approved, and sold. Reprint. 20,000 first printing.

A collection of essays containing tales of chemists and their discoveries from the nineteenth and twentieth centuries.

This book is important because it is the first textbook in an area that has become very popular in recent times. There are around 250 research groups in crystal engineering worldwide today. The subject has been researched for around 40 years but there is still no textbook at the level of senior undergraduates and beginning PhD students. This book is expected to fill this gap.The writing style is simple, with an adequate number of exercises and problems, and the diagrams are easy to understand. This book consists major areas of the subject, including organic crystals and co-ordination polymers, and can easily form the basis of a 30 to 40 lecture course for senior undergraduates.

Organic chemistry is a core part of the chemistry curricula, andadvanced levels texts often obscure the essential frameworkunderlying and uniting the vast numbers of reactions as a result ofthe high level of detail presented. The material in this book iscondensed into a manageable text of 350 pages and presented in aclear and logical fashion, focusing purely on the basics of thesubject without going through exhaustive detail or repetitiveexamples. The book aims to bridge the gap between undergraduateorganic chemistry textbooks and advanced level textbooks, beginningwith a basic introductory course and arranging the reactionmechanisms according to an ascending order of difficulty. As such,the author believes the book will be excellent primer for advancedpostgraduates Reaction Mechanisms in Organic Synthesis is written fromthe point of view of the synthetic organic chemist, enablingstudents and researchers to understand and expand on reactionscovered in foundation courses, and to apply them in a practicalcontext by designing syntheses. As a further aid to the practicalresearch student, the content is organized according to

theconditions under which a reaction is executed rather than by thetypes of mechanisms. Particular emphasis is placed on controllingstereospecificity and regiospecificity. Topics covered include: Transition metal mediated carbon-carbon bond formationreactions Use of stabilized carbanions, ylides and enamines forcarbon-carbon bond formation reactions, Advanced level use of oxidation and reduction reagents insynthesis. As a modern text, this book stands out from its competitors dueto its comprehensive coverage of recently published research. Thebook contains specific examples from the latest literature,covering modern reactions and the latest procedural modifications.The focus on contemporary and synthetically useful reactionsensures that the contents are specifically relevant and attractiveto postgraduate students and industrial organic chemists.

In the time since the second edition of The ACS Style Guide was published, the rapid growth of electronic communication has dramatically changed the scientific, technical, and medical (STM) publication world. This dynamic mode of dissemination is enabling scientists, engineers, and medical practitioners all over the world to obtain and transmit information quickly and easily. An essential constant in this changing environment is the requirement that information remain accurate, clear, unambiguous, and ethically sound. This extensive revision of The ACS Style Guide thoroughly examines electronic tools now available to assist STM writers in preparing manuscripts and communicating with publishers. Valuable updates include discussions of markup languages, citation of electronic sources, online submission of manuscripts, and preparation of figures, tables, and structures. In keeping current with the changing environment, this edition also contains references to many resources on the internet. With this wealth of new information, The ACS Style Guide's Third Edition continues its long tradition of providing invaluable insight on ethics in scientific communication, the editorial process, copyright, conventions in chemistry, grammar, punctuation, spelling, and writing style for any STM author, reviewer, or editor. The Third Edition is the definitive source for all information needed to write, review, submit, and edit scholarly and scientific manuscripts.

The use of water as a medium for promoting organic reactions has been rather neglected in the development of organic synthesis, despite the fact that it is the solvent in which almost all biochemical processes take place. Chemists have only recently started to appreciate the enormous potential water has to offer in the development of new synthetic reactions and strategies, where it can offer benefits in both unique chemistry and reduced environmental impact. In this new book, the editor, well known for his contribution to the development of water as a useful medium in synthetic organic chemistry, has assembled an international team of authors, themselves at the forefront of research into the use of the unique properties of water carrying out organic transformations, to provide a timely and concise overview of current research. By focusing on the practical use of water in synthetic organic chemistry, and with the concern for the use of solvents in organic chemistry, professional chemists, particularly those involved in industrial research and development, will find this book an essential guide to the current state of the art, and a useful starting point in their own research. Academic chemists, including postgraduate and advanced undergraduate students, will find this book an invaluable guide to this exciting and important area of chemistry.

The Frontiers in Chemistry Editorial Office team are delighted to present the inaugural “Frontiers in Chemistry: Rising Stars” article collection, showcasing the high-quality work of internationally recognized researchers in the early stages of their independent careers. All Rising Star researchers featured within this collection were individually nominated by the Journal’s Chief Editors in recognition of their potential to influence the future directions in their respective fields. The work presented here highlights the diversity of research performed across the entire breadth of the chemical sciences, and presents advances in theory, experiment and methodology with applications to compelling problems. This Editorial features the corresponding author(s) of each paper published within this important collection, ordered by section alphabetically, highlighting them as the great researchers of the future. The Frontiers in Chemistry Editorial Office team would like to thank each researcher who contributed their work to this collection. We would also like to personally thank our Chief Editors for their exemplary leadership of this article collection; their strong support and passion for this important, community-driven collection has ensured its success and global impact. Laurent Mathey, PhD Journal Development Manager

A decade ago, the U.S. chemical industry was in decline. Of the more than 40 chemical manufacturing plants being built worldwide in the mid-2000s with more than $1 billion in capitalization, none were under construction in the United States. Today, as a result of abundant domestic supplies of affordable natural gas and natural gas liquids resulting from the dramatic rise in shale gas production, the U.S. chemical industry has

gone from the world's highest-cost producer in 2005 to among the lowest-cost producers today. The low cost and increased supply of natural gas and natural gas liquids provides an opportunity to discover and develop new catalysts and processes to enable the direct conversion of natural gas and natural gas liquids into value-added chemicals with a lower carbon footprint. The economic implications of developing advanced technologies to utilize and process natural gas and natural gas liquids for chemical production could be significant, as commodity, intermediate, and fine chemicals represent a higher-economic-value use of shale gas compared with its use as a fuel. To better understand the opportunities for catalysis research in an era of shifting feedstocks for chemical production and to identify the gaps in the current research portfolio, the National Academies of Sciences, Engineering, and Medicine conducted an interactive, multidisciplinary workshop in March 2016. The goal of this workshop was to identify advances in catalysis that can enable the United States to fully realize the potential of the shale gas revolution for the U.S. chemical industry and, as a result, to help target the efforts of U.S. researchers and funding agencies on those areas of science and technology development that are most critical to achieving these advances. This publication summarizes the presentations and discussions from the workshop.