Nmr The Toolkit University Of Oxford

This text is aimed at people who have some familiarity with high-resolution NMR and who wish to deepen their understanding of how NMR experiments actually ‘work’. This revised and updated edition takes the same approach as the highly-acclaimed first edition. The text concentrates on the description of commonly-used experiments and explains in detail the theory behind how such experiments work. The quantum mechanical tools needed to analyse pulse sequences are introduced set by step, but the approach is relatively informal with the emphasis on obtaining a good understanding of how the experiments actually work. The use of two-colour printing and a new larger format improves the readability of the text. In addition, a number of new topics have been introduced: How product operators can be extended to describe experiments in AX2 and AX3 spin systems, thus making it possible to discuss the important APT, INEPT and DEPT experiments often used in carbon-13 NMR. Spin system analysis i.e. how shifts and couplings can be extracted from strongly-coupled (second-order) spectra. How the presence of chemically equivalent spins leads to spectral features which are somewhat unusual and possibly misleading, even at high magnetic fields. A discussion of chemical exchange effects has been introduced in order to help with the explanation of transverse relaxation. The double-quantum spectroscopy of a three-spin system is now considered in more detail. Reviews of the First Edition “For anyone wishing to know what really goes on in their NMR experiments, I would highly recommend this book” – Chemistry World “...I warmly recommend for budding NMR spectroscopists, or others who wish to deepen their understanding of elementary NMR theory or theoretical tools” – Magnetic Resonance in Chemistry

The renowned Oxford Chemistry Primers series, which provides focused introductions to a range of important topics in chemistry, has been refreshed and updated to suit the needs of today's students, lecturers, and postgraduate researchers. The rigorous, yet accessible, treatment of each subject area is ideal for those wanting a primer in a given topic to prepare them for more advanced study or research. Moreover, cutting-edge examples and applications throughout the texts show the relevance of the chemistry being described to current research and industry. The learning features provided, including questions at the end of every chapter and online multiple-choice questions, encourage active learning and promote understanding. Furthermore, frequent diagrams, margin notes, and glossary definitions all help to enhance a student's understanding of these essential areas of chemistry. Nuclear Magnetic Resonance offers a concise and accessible introduction to the physical principles of liquid-state NMR, a powerful technique for probing molecular structures. Examples, applications, and exercises are provided throughout to enable beginning undergraduates to get to grips with this important analytical technique. Online Resource Centre The Online Resource Centre to accompany Nuclear Magnetic Resonance features: For registered adopters of the text: * Figures from the book available to download For students: * Multiple-choice questions for self-directed learning * Full worked solutions to the end-of-chapter exercises

NMR in Pharmaceutical Sciences is intended to be a comprehensive source of information for the many individuals that utilize MR

in studies of relevance to the pharmaceutical sector. The book is intended to educate and inform those who develop and apply MR approaches within the wider pharmaceutical environment, emphasizing the toolbox that is available to spectroscopists and radiologists. This book is structured on the key processes in drug discovery, development and manufacture, but underpinned by an understanding of fundamental NMR principles and the unique contribution that NMR (including MRI) can provide. After an introductory chapter, which constitutes an overview, the content is organised into five sections. The first section is on the basics of NMR theory and relevant experimental methods. The rest follow a sequence based on the chronology of drug discovery and development, firstly 'Idea to Lead' then 'Lead to Drug Candidate', followed by 'Clinical Development', and finally 'Drug Manufacture'. The thirty one chapters cover a vast range of topics from analytical chemistry, including aspects involved in regulatory matters and in the prevention of fraud, to clinical imaging studies. Whilst this comprehensive volume will be essential reading for many scientists based in pharmaceutical and related industries, it should also be of considerable value to a much wider range of academic scientists whose research is related to the various aspects of pharmaceutical R&D; for them it will supply vital understanding of pharmaceutical industrial concerns and the basis of key decision making processes. About eMagRes Handbooks eMagRes (formerly the Encyclopedia of Magnetic Resonance) publishes a wide range of online articles on all aspects of magnetic resonance in physics, chemistry, biology and medicine. The existence of this large number of articles, written by experts in various fields, is enabling the publication of a series of eMagRes Handbooks on specific areas of NMR and MRI. The chapters of each of these handbooks will comprise a carefully chosen selection of eMagRes articles. In consultation with the eMagRes Editorial Board, the eMagRes handbooks are coherently planned in advance by specially-selected Editors, and new articles are written to give appropriate complete coverage. The handbooks are intended to be of value and interest to research students, postdoctoral fellows and other researchers learning about the scientific area in question and undertaking relevant experiments, whether in academia or industry. Have the content of this handbook and the complete content of eMagRes at your fingertips! Visit: www.wileyonlinelibrary.com/ref/eMagRes

Nuclear magnetic resonance (NMR) is an analytical tool used by chemists and physicists to study the structure and dynamics of molecules. In recent years, no other technique has gained such significance as NMR spectroscopy. It is used in all branches of science in which precise structural determination is required and in which the nature of interactions and reactions in solution is being studied. Annual Reports on NMR Spectroscopy has established itself as a premier means for the specialist and non-specialist alike to become familiar with new techniques and applications of NMR spectroscopy. Nuclear magnetic resonance (NMR) is an analytical tool used by chemists and physicists to study the structure and dynamics of molecules In recent years, no other technique has gained such significance as NMR spectroscopy Established itself as a premier means for the specialist and non-specialist alike to become familiar with new techniques and applications of NMR spectroscopy

Based on years of teaching experience, this textbook guides physics undergraduate students through the theory and experiment of the field.

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

The open research center project “Interdisciplinary fundamental research toward realization of a quantum computer” has been supported by the Ministry of Education, Japan for five years. This is a collection of the research outcomes by the members engaged in the project. To make the presentation self-contained, it starts with an overview by Mikio Nakahara, which serves as a concise introduction to quantum information and quantum computing. Subsequent contributions include subjects from physics, chemistry, mathematics, and information science, reflecting upon the wide variety of scientists working under this project. These contributions introduce NMR quantum computing and related techniques, number theory and coding theory, quantum error correction, photosynthesis, non-classical correlations and entanglement, neutral atom quantum computer, among others. Each of contributions will serve as a short introduction to these cutting edge research fields. Contents:Computing with Quanta (M Nakahara)Implementation of a Selective Two-Qubit Gate Operation in a Neutral Atom Quantum Computer (E H Lapasar, K Kasamatsu, Y Kondo, M Nakahara and T Ohmi)Magnetic Resonance as an Experimental Device for Quantum Computing Research (M Chiba and Y Kondo)Introduction to Surface Code Quantum Computation (Y Wan)Quantum Computing and Number Theory (Y Sasaki)Linear Preservers in Nonclassical Correlation Theories: An Introduction (A SaiToh, R Rahimi and M Nakahara)Identification of the Hamiltonian of a 3-Particle Ising Model with Local Transverse Fields (M A Fasihi, S Tanaka, M Nakahara and Y Kondo)How to Evaluate the Area Surrounded by Segments on a Unit Sphere? (Y Kondo)Microscopic Properties of Quantum Annealing — Application to Fully Frustrated Ising Systems (S Tanaka)Implementation of Unitary Quantum Error Correction (H Tomita)Spin Crossover Properties of Iron(II) Complexes with a N4O2 Donor Set by Extended ?-Conjugated Schiff-base Ligands (T Kuroda) OKNMR Spectroscopic Studies of Light-Harvesting Bacteriochlorophylls Purified from Green Sulfur Photosynthetic Bacteria (Y Hirai and Y Saga)Spectroscopic Studies of Individual Extramembranous Light-Harvesting Complexes of Green Photosynthetic Bacteria (Y Saga)Entanglement Operator for a Multi-Qubit System (C Bagnasco, Y Kondo and M Nakahara)Some Topics in Coding Theory (K Chinen) Readership: Graduate students and researchers in physics, chemistry,

mathematics, informatics and computer science. Also accessible to advanced undergraduate students. Keywords:Quantum Information;Quantum Computer;Entanglement;Non-Classical Correlation;NMR;Number Theory;Coding Theory;Hamiltonian Estimation;Holonomy;Quantum Annealing;Quantum Error Correction;Photosynthesis

This second edition of Protein NMR Techniques is well written with a dynamic approach that covers multiple topics within its nineteen chapters. The text opens with a review of recombinant protein expression using two organisms, E. coli and P. pastoris that can produce high yields of isotopically labeled protein at a reasonable cost. The focus then shifts slightly to studies of aligned molecules, starting with a chapter on different options for the preparation of an aligned sample. The text also provides a comprehensive review of the use of RDCs to the study protein dynamics highlights and the range of information accessible using these methods. The book concludes with a concise explanation of the application of solid-state methods and the study of membrane proteins, a particularly important but difficult class of targets.

Charred, badly decomposed, or mummified corpses, as well as those restrictions forced upon coroners by certain religious sects, often make autopsies impossible to perform. In addition, lack of manpower among the personnel charged with performing autopsies frequently creates a backlog of cases in the coroner’s office. This delay increases the likelihood that causes of death will go undetermined and criminal perpetrators will go unpunished. The solution can be found in what has come to be known as the virtopsy®, a minimally invasive and efficient way to perform an autopsy through state-of-the-art imaging-guided means. A term coined by noted forensic pathologist Richard Dirnhofer, virtopsy refers to "virtual autopsy," a modality that employs a spectrum of technologies including computed tomography, magnetic resonance imaging and spectroscopy, and 3D photogrammetry and surface scanning. In The Virtopsy Approach: 3D Optical and Radiological Scanning and Reconstruction in Forensic Medicine, the authors reveal a comprehensive summary of the virtopsy procedure. Well-organized, detailed enough to serve as a how-to guide for newcomers to the field, and copiously illustrated with many color figures accompanied by appropriate explanatory captions, this volume breaks new ground in the world of autopsy science.

"Reissued (with corrections) as an Oxford classic text in 2013"--Verso title page.

Pore Structure of Cement-Based Materials provides a thorough treatment of the experimental techniques used to characterize the pore structure of materials. The text presents the principles and practical applications of the techniques used, organized in an easy-to-follow and uncomplicated manner, providing the theoretical background, the way to analyze experimental data, and the factors affecting the results. The book is the single comprehensive source of the techniques most commonly used for pore structure analysis, covering simple techniques like mercury intrusion porosimetry and water absorption, to the more sophisticated small-angle scattering and nuclear magnetic resonance. The book is an essential reference text for researchers, users, and students in materials science, applied physics, and civil engineering, who seek a deep understanding of the principles and limitations of the techniques used for pore structure analysis of cement-based materials.

Advances in Diagnostics and Screening Research and Application / 2012 Edition is a ScholarlyEditions™ eBook that delivers timely, authoritative, and comprehensive information about Diagnostics and Screening. The editors have built Advances in Diagnostics and Screening Research and Application / 2012 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Diagnostics and Screening in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Advances in Diagnostics and Screening Research and Application / 2012 Edition has

been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at http://www.ScholarlyEditions.com/.
Protein NMR Spectroscopy, Second Edition combines a comprehensive theoretical treatment of NMR spectroscopy with an extensive exposition of the experimental techniques applicable to proteins and other biological macromolecules in solution. Beginning with simple theoretical models and experimental techniques, the book develops the complete repertoire of theoretical principles and experimental techniques necessary for understanding and implementing the most sophisticated NMR experiments. Important new techniques and applications of NMR spectroscopy have emerged since the first edition of this extremely successful book was published in 1996. This updated version includes new sections describing measurement and use of residual dipolar coupling constants for structure determination, TROSY and deuterium labeling for application to large macromolecules, and experimental techniques for characterizing conformational dynamics. In addition, the treatments of instrumentation and signal acquisition, field gradients, multidimensional spectroscopy, and structure calculation are updated and enhanced. The book is written as a graduate-level textbook and will be of interest to biochemists, chemists, biophysicists, and structural biologists who utilize NMR spectroscopy or wish to understand the latest developments in this field. Provides an understanding of the theoretical principles important for biological NMR spectroscopy Demonstrates how to implement, optimize and troubleshoot modern multi-dimensional NMR experiments Allows for the capability of designing effective experimental protocols for investigations of protein structures and dynamics Includes a comprehensive set of example NMR spectra of ubiquitin provides a reference for validation of experimental methods
A concise, useful guide to good laboratory practice in the organic chemistry lab with hints and tips on successful organic synthesis.
NMR - The ToolkitHow Pulse Sequences WorkOxford University Press, USA
Since the introduction of FT-NMR spectroscopy around five decades ago, NMR has achieved significant advances in hardware and methodologies, accompanied with the enhancement of spectral resolution and signal sensitivity. Rapid developments in the polymers field mean that accurate and quantitative characterization of polymer structures and dynamics is the keystone for precisely regulating and controlling the physical and chemical properties of the polymer. This book specifically focuses on NMR investigation of complex polymers for the polymer community as well as NMR spectroscopists, and will push the development of both fields. It covers the latest advances, for example high field DNP and ultrafast MAS methodologies, and show how these novel NMR methods characterize various synthetic and natural polymers.
This succinct text outlines the main classes of transition metal organometallic complexes and introduces the reader to the chemistry of compounds with metal-carbon s-bonds: metal carbonyls, metal alkyls, and metal alkylidenes and alkylidnes. The synthetic methods leading to each class ofcompounds are illustrated with pertinent examples, followed by the discussion of characteristic structures and reactivity patterns. The aim is to allow undergraduate students a quick overview over this area of chemistry. Highlights and excursions stress general principles and relate the materialto specific applications such as catalytic processes.
Describes experimental methods for investigating the function of pumps, channels and transporters Covers new emerging

analytical methods used to study ion transport membrane proteins such as single-molecule spectroscopy Details a wide range of electrophysiological techniques and spectroscopic methods used to analyze the function of ion channels, ion pumps and transporters Covers state-of-the art analytical methods to study ion pumps, channels, and transporters, and where analytical chemistry can make further contributions

Integrated Drug Discovery Technologies provides a global overview of emerging drug development technologies by presenting and integrating new techniques from the disciplines of chemistry, biology, and computational sciences. It combines integration of contemporary mechanization with strategies in drug delivery. Topics include: functional genomics,

The open research center project ?Interdisciplinary fundamental research toward realization of a quantum computer? has been supported by the Ministry of Education, Japan for five years. This is a collection of the research outcomes by the members engaged in the project. To make the presentation self-contained, it starts with an overview by Mikio Nakahara, which serves as a concise introduction to quantum information and quantum computing. Subsequent contributions include subjects from physics, chemistry, mathematics, and information science, reflecting upon the wide variety of scientists working under this project. These contributions introduce NMR quantum computing and related techniques, number theory and coding theory, quantum error correction, photosynthesis, non-classical correlations and entanglement, neutral atom quantum computer, among others. Each of contributions will serve as a short introduction to these cutting edge research fields.

Bioactive natural products are proving to be a rich source of novel therapeutics to both protect against and combat diseases, as well as serve as lead compounds in crop protection. Following the successful format of the first edition, this volume brings together collective research from many new contributors and emphasizes the rationale behind the

The book gathers lecture notes of courses given at the 2014 summer school on integrated biology in Les Houches, France, Session CII. It addresses an emerging field ranging from molecules to cells and to organisms. Through examples it presents a new way of thinking using a combination of interdisciplinary and cutting-edge methods, bridging physics and biology beyond current biophysics. Important novel developments are expected in the coming years that may well introduce paradigm shifts in biological science. The school had the ambition to prepare participants to become major actors in these breakthroughs. The power of integrated approaches is illustrated through two cases: interactions between viruses and host cells, and flower development. The role of forces in biology, as well as their mathematical modeling, is illustrated in both processes: how they allow flower organs to emerge or how they control membrane fusion during virus budding. The book also underlines the importance of conformational changes and dynamics of proteins particularly during membrane processes. It explains how membrane proteins can be handled and studied by molecular simulations. Finally, the book also contains concepts in cell biology, in thermodynamics and several novel approaches such as in-cell NMR. Altogether, the chapters show how examining a biological system from different viewpoints based on multidisciplinary aspects often leads to enriching controversial arguments.

This unique book describes the latest information in the fundamental understanding of the biophysics and biochemistry of articular

cartilage using the state-of-the-art practices in NMR and MRI. This is the first book of its kind, written by physicists and chemists on this important tissue, whose degradation contributes to osteoarthritis and related joint diseases. Connecting the fundamental science with the clinical imaging applications, the experts Editors provide an authoritative addition to the literature. Ideal for practising physical scientists and radiologists with an interest in the fundamental science as well as instrument manufacturers and clinical researchers working with articular cartilage.

In his thesis, Matthias Junk takes an innovative approach to assess the local structure and dynamics of biological and synthetic amphiphilic macromolecules capable of transporting small molecules. Replacing the latter with stable radicals, he uses state-of-the-art electron paramagnetic resonance (EPR) spectroscopy to describe the highly relevant transport function from the viewpoint of the guest molecules. Such, he demonstrates that the functional structure of human serum albumin in solution significantly differs from its crystal structure – a consequence of the protein's adaptability to host various endogenous compounds and drug molecules. Further, he shows that the thermal collapse of thermoresponsive hydrogels and dendronized polymers leads to static and dynamic heterogeneities on the nanoscale. These heterogeneities bear consequences for the material's hosting properties and enable unforeseen complex catalytic functionalities.

This practical guide provides a basic overview of the pros and cons of NMR spectroscopy as both a hyphenated and non-hyphenated technique. The book begins with a description of basic NMR concepts for the structural elucidation of organic compounds and then details the historical development of NMR and hyphenated NMR in the structural elucidation world, followed by applications of hyphenated NMR as LC-NMR and LC-MS-NMR in industry and academia. It also contains updated information on the latest advancements and applications of LC-NMR in such areas as degradation products, drug metabolism, food analysis, and drug discovery. An essential resource for scientists in industry and academia who work in the areas of organic chemistry, medicinal chemistry, process chemistry, and analytical chemistry.

Foundations of Molecular Structure Determination gives a broad introduction to a range of common spectroscopic and diffraction methods, with frequent worked examples and problem questions provided to assist beginning undergraduates in developing their structure analysis skills.

Provides vital information on organometallic compounds, their preparation, and use in synthesis, and explores the fundamentals of the field and its modern applications Fully updated and expanded to reflect recent advances, the new, seventh edition of this bestselling text presents students and professional chemists with a comprehensive introduction to the principles and general properties of organometallic compounds, as well as including practical information on reaction mechanisms and detailed descriptions of contemporary applications. Increased focus is given to organic synthesis applications, nanoparticle science, and green chemistry. This edition features up-to-date examples of fundamental reaction steps and greater emphasis on key topics like oxidation catalysis, CH functionalization, nanoclusters and

nanoparticles, and green chemistry. New coverage is added for computational chemistry, energy production, and biochemical aspects of organometallic chemistry. The Organometallic Chemistry of the Transition Metals, Seventh Edition provides new/enhanced chapter coverage of ligand-assisted additions and eliminations; proton-coupled electron transfer; surface, supported, and cooperative catalysis; green, energy, and materials applications; and photoredox catalysis. It covers coordination chemistry; alkyls and hydrides; Pi-complexes; and oxidative addition and reductive elimination. The book also features sections on insertion and elimination; spectroscopy; metathesis polymerization and bond activation; and more. Provides an excellent foundation of the fundamentals of organometallic chemistry Includes end-of-chapter problems and their solutions Expands and includes up-to-date examples of fundamental reaction steps and focuses on important topics such as oxidation catalysis, CH functionalization, nanoparticles, and green chemistry Features all new coverage for computational chemistry, energy production, and biochemical aspects of organometallic chemistry The Organometallic Chemistry of the Transition Metals, Seventh Edition is an insightful book that will appeal to all advanced undergraduate and graduate students in organic chemistry, organometallic chemistry, inorganic chemistry, and bioinorganic chemistry, as well as any practicing chemist in those fields.

The renowned Oxford Chemistry Primers series, which provides focused introductions to a range of important topics in chemistry, has been refreshed and updated to suit the needs of today's students, lecturers, and postgraduate researchers. The rigorous, yet accessible, treatment of each subjectarea is ideal for those wanting a primer in a given topic to prepare them for more advanced study or research. Moreover, cutting-edge examples and applications throughout the texts show the relevance of the chemistry being described to current research and industry.This new edition of NMR Spectroscopy in Inorganic Chemistry has been extensively updated to include worked examples, problems, self-test questions, and interactive online questions encouraging active learning and promoting a deeper understanding. With a concise and accessible introduction topredicting NMR spectra and expanded sections on quadrupolar nuclei, this excellent introductory text will help students get to grips with the basics before building on that understanding through diagrammatic content to explain the more challenging concepts.Examples are included from many different areas of inorganic chemistry which are then closely related to the theory described. By giving a simple overview of the relevant theory and avoiding the "pattern recognition" approach frequently used, it demystifies NMR.

This 2nd edition begins with an overview of NMR development and applications in biological systems. It describes recent developments in instrument hardware and methodology. Chapters highlight the scope and limitation of NMR methods. While detailed math and quantum mechanics dealing with NMR theory have been addressed in several well-known NMR volumes, chapter two of this volume illustrates the fundamental principles and concepts of NMR spectroscopy in a more

descriptive manner. Topics such as instrument setup, data acquisition, and data processing using a variety of offline software are discussed. Chapters further discuss several routine stategies for preparing samples, especially for macromolecules and complexes. The target market for such a volume includes researchers in the field of biochemistry, chemistry, structural biology and biophysics.

The renowned Oxford Chemistry Primers series, which provides focused introductions to a range of important topics in chemistry, has been refreshed and updated to suit the needs of today's students, lecturers, and postgraduate researchers. The rigorous, yet accessible, treatment of each subject area is ideal for those wanting a primer in a given topic to prepare them for more advanced study or research. NMR: The Toolkit describessuccinctly the range of NMR techniques commonly used in modern research to probe the structures and properties of molecules in liquids. Emphasis is placed throughout on how these experiments actually work, givinga unique perspective on this powerful experimental tool.

Nuclear Magnetic Resonance Spectroscopy (NMR) is now widely regarded as having evolved into a subscience. The field has become immensely diverse, ranging from medical use through solid state NMR to liquid state applications, with countless books and scientific journals devoted to these topics. Theoretical as well as experimental advance continues to be rapid, and has in fact accelerated by many novel innovations. This multi-authored book focuses on the latest developments in the rapidly evolving field of high resolution NMR, specifically with a view to applications on the structure elucidation of organic molecules of moderate molecular weight. Conceptually it differs from basic educational texts, hard-core scientific papers and regular review articles in that each chapter may be regarded as the authors' personal account of their special insights and results that crystallised after several years of research into a given topic. The book revolves around several themes and offers a handful of scientific "gems" of various colors, reflecting the great diversity of NMR. It contains 16 loosely connected chapters written by some of today's most accomplished NMR scientists in the world. Each chapter is a unique synthesis of the authors' previous research results in the given field, and thus projects special insights. Much emphasis has been given to the latest developments in NMR, in particular to selective pulses and pulsed field gradients. As a part of the series "Analytical Spectroscopy Library", with subsequent editions coming along this book should provide a platform for future research accounts of similar flavor. The material is presented in a mostly non-mathematical fashion, and is intended mainly for chemists, application NMR scientists and students with already some background in NMR. Some of the chapters slightly overlap in the discussed topics, which is particularly exciting in terms of gaining insight into the same area from different angles.

Nuclear Magnetic Resonance (NMR) spectroscopy is the most powerful technique for characterization of biomolecular

structures at atomic resolution in the solution state. This timely book, entitled "Biomolecular NMR Spectroscopy," focuses on the latest state-of-the-art NMR techniques for characterization of biological macromolecules in the solid and solution state. The editors, Dr. Andrew Dingley (University of Auckland, New Zealand) and Dr. Steven Pascal (Massey University, New Zealand) have organized the book into four sections, covering the following topics: sample preparation, structure and dynamics of proteins, structure and dynamics of nucleic acids and protein-nucleic acid complexes, and rapid and hybrid techniques--

Equilibrium inorganic chemistry underlies the composition and properties of the aquatic environment and provides a sound basis for understanding both natural geochemical processes and the behaviour of inorganic pollutants in the environment. This clear and progressive introduction to the topic uses a wide range of examples to explain the behaviour of chemical species in aquatic systems.

The first major reference at the interface of chemistry, biology, and medicine Chemical biology is a rapidly developing field that uses the principles, tools, and language of chemistry to answer important questions in the life sciences. It has enabled researchers to gather critical information about the molecular biology of the cell and is the fundamental science of drug discovery, playing a key role in the development of novel agents for the prevention, diagnosis, and treatment of disease. Now students and researchers across the range of disciplines that use chemical biology techniques have a single resource that encapsulates what is known in the field. It is an excellent place to begin any chemical biology investigation. Major topics addressed in the encyclopedia include: Applications of chemical biology Biomolecules within the cell Chemical views of biology Chemistry of biological processes and systems Synthetic molecules as tools for chemical biology Technologies and techniques in chemical biology Some 300 articles range from pure basic research to areas that have immediate applications in fields such as drug discovery, sensor technology, and catalysis. Novices in the field can turn to articles that introduce them to the basics, whereas experienced researchers have access to articles exploring the cutting edge of the science. Each article ends with a list of references to facilitate further investigation. With contributions from leading researchers and pioneers in the field, the Wiley Encyclopedia of Chemical Biology builds on Wiley's unparalleled reputation for helping students and researchers understand the crucial role of chemistry and chemical techniques in the life sciences.

Presents the lecture notes of the Les Houches Summer School on Quantum entanglement and information processing. This book aims to establish connections between the communities of quantum optics and of quantum electronic devices working in the area of quantum computing. It is useful for graduate students with a basic knowledge of quantum mechanics.

At a time when U.S. high school students are producing low scores in mathematics and science on international examinations, a thorough grounding in physical chemistry should not be considered optional for science undergraduates. Based on the author's thirty years of teaching, Essentials of Physical Chemistry merges coverage of calculus with chemist

Nuclear magnetic resonance (NMR) is an enormously powerful and versatile method for investigating the structure and dynamics of molecules. This book provides the conceptual and theoretical tools needed to understand the inner workings of modern NMR experiments. The approach is relatively informal, accessible and concise.

All the basic principles of the field of aromatic chemistry are clearly presented in this important account. Many compounds of industrial and biological significance are used as examples with consideration given to structure, reactions, and properties. Topics such as thermodynamic versus kinetic control and pericyclic reactions are also introduced. In addition to benzene and the classes of aromatic compounds derived from it, the text covers polycyclic arenes, and the small and large ring systems which are embraced by the wider definition of aromaticity. The text will be especially useful for courses in organic chemistry.