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Nuclear Magnetic Resonance (NMR) spectroscopy is a powerful and theoretically complex analytical tool. Basic 1H- and 13C-NMR Spectroscopy provides an introduction to the principles and applications of NMR spectroscopy. Whilst looking at the problems students encounter when using NMR spectroscopy, the author avoids the complicated mathematics that are applied within the field. Providing a rational description of the NMR phenomenon, this book is easy to read and is suitable for the undergraduate and graduate student in chemistry. Describes the fundamental principles of the pulse NMR experiment and 2D NMR spectra. Easy to read and written with the undergraduate and graduate chemistry student in mind Provides a rational description of NMR spectroscopy without complicated mathematics.

Nuclear Magnetic Resonance Spectroscopy combines clear and concise discussions of key NMR concepts with succinct and illustrative examples. Designed to cover a full course in Nuclear Magnetic Resonance (NMR) Spectroscopy, this text offers complete coverage of classic (one-dimensional) NMR as well as up-to-date coverage of two-dimensional NMR and other modern methods. It contains practical advice, theory, illustrated applications, and classroom-tested problems; looks at such important ideas as relaxation, NOEs, phase cycling, and processing parameters; and provides brief, yet fully comprehensible, examples. It also uniquely lists all of the general parameters for many...
experiments including mixing times, number of scans, relaxation times, and more. Nuclear Magnetic Resonance Spectroscopy: An Introduction to Principles, Applications, and Experimental Methods, 2nd Edition begins by introducing readers to NMR spectroscopy - an analytical technique used in modern chemistry, biochemistry, and biology that allows identification and characterization of organic, and some inorganic, compounds. It offers chapters covering: Experimental Methods; The Chemical Shift; The Coupling Constant; Further Topics in One-Dimensional NMR Spectroscopy; Two-Dimensional NMR Spectroscopy; Advanced Experimental Methods; and Structural Elucidation. Features classical analysis of chemical shifts and coupling constants for both protons and other nuclei, as well as modern multi-pulse and multi-dimensional methods. Contains experimental procedures and practical advice relative to the execution of NMR experiments. Includes a chapter-long, worked-out problem that illustrates the application of nearly all current methods. Offers appendices containing the theoretical basis of NMR, including the most modern approach that uses product operators and coherence-level diagrams. By offering a balance between volumes aimed at NMR specialists and the structure-determination-only books that focus on synthetic organic chemists, Nuclear Magnetic Resonance Spectroscopy: An Introduction to Principles, Applications, and Experimental Methods, 2nd Edition is an excellent text for students and post-graduate students working in analytical and bio-sciences, as well as scientists who use NMR spectroscopy as a primary tool in their work.

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Nuclear Magnetic Resonance in Chemistry - 1986-09-05
Nuclear magnetic resonance spectroscopy - Addison Ault - 1976
Spectroscopic Analyses - Eram Sharmin - 2017-12-06
The book presents developments and applications of these methods, such as NMR, mass, and others, including their applications in pharmaceutical and
growth as an analytical method. Modern NMR spectroscopy is a highly
covers spectroscopic methods, their applications, and their significance as
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This book would be useful for students, scholars, and scientists engaged in
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**High-resolution NMR Techniques in Organic Chemistry** - T. Claridge -
1999
From the initial observation of proton magnetic resonance in water and in
paraffin, the discipline of nuclear magnetic resonance has seen unparalleled
growth as an analytical method. Modern NMR spectroscopy is a highly
developed, yet still evolving, subject which finds application in chemistry,
biology, medicine, materials science and geology. In this book, emphasis is
on the more recently developed methods of solution-state NMR applicable
to chemical research, which are chosen for their wide applicability and
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**NMR Spectroscopy** - Harald Günther - 2013-12-13
Nuclear magnetic resonance (NMR) spectroscopy is one of the most
powerful and widely used techniques in chemical research for investigating
structures and dynamics of molecules. Advanced methods can even be
utilized for structure determinations of biopolymers, for example proteins or
nucleic acids. NMR is also used in medicine for magnetic resonance imaging
(MRI). The method is based on spectral lines of different atomic nuclei that
are excited when a strong magnetic field and a radiofrequency transmitter
are applied. The method is very sensitive to the features of molecular
structure because also the neighboring atoms influence the signals from
individual nuclei and this is important for determining the 3D-structure of
molecules. This new edition of the popular classic has a clear style and a
highly practical, mostly non-mathematical approach. Many examples are
taken from organic and organometallic chemistry, making this book an
invaluable guide to undergraduate and graduate students of organic
chemistry, biochemistry, spectroscopy or physical chemistry, and to
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Problems and solutions are included.

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Problems and solutions are included.

**NMR and Chemistry** - J.W. Akitt - 2017-12-21
Keeping mathematics to a minimum, this book introduces nuclear
properties, nuclear screening, chemical shift, spin-spin coupling, and
relaxation. It is one of the few books that provides the student with the
physical background to NMR spectroscopy from the point of view of the
whole of the periodic table rather than concentrating on the narrow
applications of 1H and 13C NMR spectroscopy. Aids to structure
determination, such as decoupling, the nuclear Overhauser effect, INEPT,
DEPT, and special editing, and two dimensional NMR spectroscopy are
discussed in detail with examples, including the complete assignment of the
1H and 13C NMR spectra of D-amygdalin. The authors examine the
requirements of a modern spectrometer and the effects of pulses and
discuss the effects of dynamic processes as a function of temperature or
pressure on NMR spectra. The book concludes with chapters on some of the
applications of NMR spectroscopy to medical and non-medical imaging
techniques and solid state chemistry of both I = F1/2 and I > F1/2 nuclei.
Examples and problems, mainly from the recent inorganic/organometallic
chemistry literature support the text throughout. Brief answers to all the
problems are provided in the text with full answers at the end of the book.

**Phosphorus-31 NMR Spectroscopy** - Olaf Kühl - 2008-08-22
Nuclear Magnetic Resonance is a powerful tool, especially for the
identification of 1 13 hitherto unknown organic compounds. H- and C-NMR
spectroscopy is known and applied by virtually every synthetically working
Organic Chemist. Consequently, the factors governing the differences in
chemical shift values, based on chemical environment, bonding,
temperature, solvent, pH, etc., are well understood, and specialty methods
developed for almost every conceivable structural challenge. Proton and
carbon NMR spectroscopy is part of most bachelors degree courses, with
advanced methods integrated into masters degree and other graduate
courses. In view of this universal knowledge about proton and carbon NMR
spectroscopy within the chemical community, it is remarkable that
heteronuclear NMR is still looked upon as something of a curiosity.
Admittedly, most organic compounds contain only nitrogen, oxygen, and
sulfur atoms, as well as the obligatory hydrogen and carbon atoms,
elements that have an unfavourable isotope distribution when it comes to
NMR spectroscopy. Each of these three elements has a dominant isotope:
14 16 32 16 32 N (99.63% natural abundance), O (99.76%), and S (95.02%), with O, S, and 34 14 S (4.21%) NMR silent. N has a nuclear moment
volume includes late-breaking areas such as functional imaging, flow imaging, bioreactor spectroscopy, and chemical shift imaging. All chapters are written in a "current concepts" style that renders information accessible to readers at all levels. Contributors are known experts in the field, lending the book an international perspective.

**NMR In Physiology and Biomedicine** - Robert J. Gillies - 2013-10-22
This book provides a comprehensive review of modern nuclear magnetic resonance approaches to biomedical problems in vivo using state-of-the-art techniques. It devotes equal attention to the methods and applications of NMR and addresses the potential of each of the techniques discussed. The volume includes late-breaking areas such as functional imaging, flow imaging, bioreactor spectroscopy, and chemical shift imaging. All chapters are written in a "current concepts" style that renders information accessible to readers at all levels. Contributors are known experts in the field, lending the book an international perspective.

**Biological NMR Spectroscopy** - John L. Markley - 1997-01-30
This book presents a critical assessment of progress on the use of nuclear magnetic resonance spectroscopy to determine the structure of proteins, including brief reviews of the history of the field along with coverage of current clinical and in vivo applications. The book, in honor of Oleg Jardetsky, one of the pioneers of the field, is edited by two of the most highly respected investigators using NMR, and features contributions by most of the leading workers in the field. It will be valued as a landmark publication that presents the state-of-the-art perspectives regarding one of today's most important technologies.
Proton & Carbon NMR Spectra of Polymers - Quang Tho Pham - 2019-11-11

Proton and Carbon NMR Spectra of Polymers is an updated, consolidated volume featuring the spectra published in three previous volumes, plus 150 newly derived spectra. It contains 458 NMR spectra with associated analytical notes covering acrylics, amides, dienes, ethers, olefins, siloxins, styrenes and derivatives, urethanes, vinyls, vinylidenes, and others. The spectra obtained are either 1H or 13C; extended bibliographic references are attached. Each entry provides details of the chemical structure of the analyzed sample, in addition to analytical conditions including nucleus, frequency, spectrometer, detection technique, solvent, temperature, reference, lock and, where appropriate, flip angle. The wealth of information contained in this single volume make Proton and Carbon NMR Spectra of Polymers an essential acquisition for all academic, industrial research, and analytical laboratories and libraries involved with polymer chemistry.

NMR in Chemistry - William Kemp - 1988

Introduction to NMR Spectroscopy - Raymond J. Abraham - 1988-11-24

Introduction to NMR Spectroscopy R. J. Abraham, School of Chemistry, University of Liverpool J. Fisher, Biological NMR Centre, University of Leicester P. Loftus, Stuart Pharmaceuticals, Delaware, USA This book is a new, extended edition of Proton and Carbon 13 NMR by R. J. Abraham and P. Loftus. The initial chapters cover the fundamentals of NMR spectroscopy commencing with an explanation of how the nuclear magnetic response occurs, followed by a detailed discussion of chemical shifts and coupling constants, parameters not discussed to any length in other textbooks aimed at a similar level of interest. Emphasis is given to the vectorial description of multipulse experiments, as this is probably the easiest way to grasp how different information may be gained simply by changing a pulse sequence. An understanding of multipulse NMR is a prerequisite for understanding 2D NMR. The section on 2D NMR begins with a discussion of the resolved experiment. This is a logical initial choice as the spectra produced by this experiment may be readily compared with 1D spectra. Following on from this both heteronuclear and homonuclear correlation spectroscopy are described and examples given. The final section of the book should be considered as an applications section. It is aimed at showing the reader that NMR is not just of use to the synthetic organic chemist but is also of use to biochemists for investigating the solution state structure and function of proteins, enzymes, etc. The application of high resolution NMR to the solid state is also discussed, thereby indicating the developments which have taken place as far as spectrometer hardware is concerned.

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A Complete Introduction to Modern NMR Spectroscopy - Roger S. Macomber - 1998
Clear, accessible coverage of modern NMR spectroscopy-for students and professionals in many fields of science Nuclear magnetic resonance (NMR) spectroscopy has made quantum leaps in the last decade, becoming a staple tool in such divergent fields as chemistry, physics, materials science, biology, and medicine. That is why it is essential that scientists working in these areas be fully conversant with current NMR theory and practice. This down-to-basics text offers a comprehensive, up-to-date treatment of the fundamentals of NMR spectroscopy. Using a straightforward approach that develops all concepts from a rudimentary level without using heavy mathematics, it gives readers the knowledge they need to solve any molecular structure problem from a complete set of NMR data. Topics are illustrated throughout with hundreds of figures and actual spectra. Chapter-end summaries and review problems with answers are included to help reinforce and test understanding of key material. From NMR studies of biologically important molecules to magnetic resonance imaging, this book serves as an excellent all-around primer on NMR spectroscopic analysis.

Understanding NMR Spectroscopy - James Keeler - 2011-09-19
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
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NMR Spectroscopy in Pharmaceutical Analysis - Iwona Wawer - 2017-07-07
For almost a decade, quantitative NMR spectroscopy (qNMR) has been established as valuable tool in drug analysis. In all disciplines, i.e. drug identification, impurity profiling and assay, qNMR can be utilized. Separation techniques such as high performance liquid chromatography, gas chromatography, super fluid chromatography and capillary electrophoresis techniques, govern the purity evaluation of drugs. However, these techniques are not always able to solve the analytical problems often resulting in insufficient methods. Nevertheless such methods find their way into international pharmacopoeias. Thus, the aim of the book is to describe the possibilities of qNMR in pharmaceutical analysis. Beside the introduction to the physical fundamentals and techniques the principles of the application in drug analysis are described: quality evaluation of drugs, polymer characterization, natural products and corresponding reference compounds, metabolism, and solid phase NMR spectroscopy for the characterization drug substances, e.g. the water content, polymorphism, and drug formulations, e.g. tablets, powders. This part is accompanied by more special chapters dealing with representative examples. They give more detailed information by means of concrete examples. Combines theory, techniques, and concrete applications—all of which closely resemble the laboratory experience Considers international pharmacopoeias, addressing the concern for licensing Features the work of academics and researchers, appealing to a broad readership

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Applied NMR Spectroscopy for Chemists and Life Scientists  - Oliver Zerbe  - 2013-11-26

From complex structure elucidation to biomolecular interactions - this application-oriented textbook covers both theory and practice of modern NMR applications. Part one sets the stage with a general description of NMR introducing important parameters such as the chemical shift and scalar or dipolar couplings. Part two describes the theory behind NMR, providing a profound understanding of the involved spin physics, deliberately kept shorter than in other NMR textbooks, and without a rigorous mathematical treatment of all the physico-chemical computations. Part three discusses technical and practical aspects of how to use NMR. Important phenomena such as relaxation, exchange, or the nuclear Overhauser effects and the methods of modern NMR spectroscopy including multidimensional experiments, solid state NMR, and the measurement of molecular interactions are the subject of part four. The final part explains the use of NMR for the structure determination of selected classes of complex biomolecules, from steroids to peptides or proteins, nucleic acids, and carbohydrates. For chemists as well as users of NMR technology in the biological sciences.

Applied NMR Spectroscopy for Chemists and Life Scientists  - Oliver Zerbe  - 2013-11-26

NMR for Liquid Fossil Fuels  - L. Petrakis  - 2012-12-02

High resolution nuclear magnetic resonance (NMR) of liquid fuels has provided valuable information on the molecular structures present in these fuels. The chemical insight gained through NMR studies has the potential to enhance significantly the development of processes for the utilization of fossil energy. For this potential to be fully realized, users of NMR information must be able to communicate effectively with NMR experts. Conversely, NMR experts must understand the type of information that users will attempt to derive from their spectra. The goal of this book is to strengthen the lines of communication between NMR experts and users in the area of NMR of liquid fuels. The book comprises two parts. The first part presents elements of relevant NMR phenomenology, including a definition of the most important NMR parameters, an introduction to Fourier
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**Organic Spectroscopy** - Lal Dhar Singh Yadav - 2013-08-30
Organic Spectroscopy presents the derivation of structural information from UV, IR, Raman, 1H NMR, 13C NMR, Mass and ESR spectral data in such a way that stimulates interest of students and researchers alike. The application of spectroscopy for structure determination and analysis has seen phenomenal growth and is now an integral part of Organic Chemistry courses. This book provides: -A logical, comprehensive, lucid and accurate presentation, thus making it easy to understand even through self-study; -Theoretical aspects of spectral techniques necessary for the interpretation of spectra; -Salient features of instrumentation involved in spectroscopic methods; -Useful spectral data in the form of tables, charts and figures; -Examples of spectra to familiarize the reader; -Many varied problems to help build competence ad confidence; -A separate chapter on ‘spectroscopic solutions of structural problems’ to emphasize the utility of spectroscopy. Organic Spectroscopy is an invaluable reference for the interpretation of various spectra. It can be used as a basic text for undergraduate and postgraduate students of spectroscopy as well as a practical resource by research chemists. The book will be of interest to chemists and analysts in academia and industry, especially those engaged in the synthesis and analysis of organic compounds including drugs, drug intermediates, agrochemicals, polymers and dyes.
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Nuclear Magnetic Resonance - P. J. Hore - 2015
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 an 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

In Vivo NMR Spectroscopy - Robin A. de Graaf - 2019-03-11
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Presents basic concepts, experimental methodology and data acquisition, and processing standards of in vivo NMR spectroscopy. This book covers, in detail, the technical and biophysical aspects of in vivo NMR techniques and includes novel developments in the field such as hyperpolarized NMR, dynamic 13C NMR, automated shimming, and parallel acquisitions. Most of the techniques are described from an educational point of view, yet it still retains the practical aspects appreciated by experimental NMR spectroscopists. In addition, each chapter concludes with a number of exercises designed to review, and often extend, the presented NMR principles and techniques. The third edition of In Vivo NMR Spectroscopy: Principles and Techniques has been updated to include experimental detail on the developing area of hyperpolarization; a description of the semi-LASER sequence, which is now a method of choice; updated chemical shift data, including the addition of 31P data; a troubleshooting section on common problems related to shimming, water suppression, and quantification; recent developments in data acquisition and processing standards; and MatLab scripts on the accompanying website for helping readers calculate radiofrequency pulses. Provide an educational explanation and overview of in vivo NMR, while maintaining the practical aspects appreciated by experimental NMR spectroscopists. Features more experimental methodology than the previous edition. End-of-chapter exercises that help drive home the principles and techniques and offer a more in-depth exploration of quantitative MR equations. Designed to be used in conjunction with a teaching course on the subject. In Vivo NMR Spectroscopy: Principles and Techniques, 3rd Edition is aimed at all those involved in fundamental and/or diagnostic in vivo NMR, ranging from people working in dedicated in vivo NMR institutes, to radiologists in hospitals, researchers in high-resolution NMR and MRI, and in areas such as neurology, physiology, chemistry, and medical biology.

Following its well-received predecessor, this book offers an essential guide to chemists for understanding fluorine in spectroscopy. With over 1000 compounds and 100 spectra, the second edition adds new data - featuring fluorine effects on nitrogen NMR, chemical shifts, and coupling constants. Explains how to successfully incorporate fluorine into target molecules and utilize fluorine substituents to structurally characterize organic compounds. Includes new data on nitrogen NMR, focusing on N-15, to portray the influence of fluorine upon nitrogen NMR chemical shifts and coupling constants. Expands on each chapter from the first edition with additional details and examples.
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**Carbon-13 NMR Spectroscopy** - J Stothers - 2012-12-02
Carbon-13 NMR Spectroscopy focuses on the potential of 13C techniques and the practical difficulties associated with the detection of 13C NMR absorption. This monograph includes a descriptive presentation of 13C shielding results that has been adopted with emphasis on the structural and stereochemical aspects. Organized into four parts encompassing 11 chapters, this book starts with an overview of the characteristics of the NMR signals derived from compounds containing 13C nuclei in natural abundance that are inherently much weaker than those exhibited by protons. This monograph then compares the primary characteristics of 13C NMR with the more familiar proton methods. Other chapters consider the 13C spectra of pyridine, pyridazine, pyrimidine, pyrazine, s-triazine, and s-tetrazine. The final chapter deals with the effects of solute–solvent interactions on the shieldings of other nuclei. This monograph is intended for organic chemists, graduate students, and researchers in various branches of chemistry with an interest in 13C NMR methods as another approach to chemical problems.

Introduction what is organic chemistry all about?; Structural organic chemistry the shapes of molecules functional groups; Organic nomenclature; Alkanes; Stereoisomerism of organic molecules; Bonding in organic molecules atomic-orbital models; More on nomenclature compounds other than hydrocarbons; Nucleophilic substitution and elimination reactions; Separation and purification identification of organic compounds by spectroscopic techniques; Alkenes and alkynes. Ionic and radical addition reactions; Alkenes and alkynes; Oxidation and reduction reactions; Acidity or alkynes.

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Spin Resonance Spectroscopy: Principles and Applications presents the principles, recent advancements and applications of nuclear magnetic resonance (NMR) and electron paramagnetic resonance (EPR) in a single multi-disciplinary reference. Spin resonance spectroscopic techniques through NMR and EPR are widely used by chemists, physicists, biologists and medicinal chemists. This book addresses the need for new spin resonance spectroscopy content while also presenting the principles, recent advancements and applications of NMR and EPR simultaneously. Ideal for researchers and students alike, the book provides a single source of NMR and EPR applications using a dynamic, holistic and multi-disciplinary approach. Presents a highly interdisciplinary approach by including NMR and EPR applications in chemistry, physics, biology and biotechnology. Addresses both NMR and EPR, making its concepts and applications implementable in multiple resonance environments and core scientific disciplines. Features a broad range of methods, examples and illustrations for both NMR and EPR to aid in retention and underscore key concepts.

Provides a theoretical introduction to graduate scientists and industrial researchers towards the understanding of the assignment of 1H NMR spectra. Discusses, and includes on enclosed CD, one of the best, the fastest and most applicable pieces of NMR prediction software available. Allows students of organic chemistry to solve problems on 1H NMR with access to over 500 assigned spectra.

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NMR Spectroscopy Explained - Neil E. Jacobsen - 2007-09-10
Basic One- and Two-dimensional NMR Spectroscopy - Horst Friebolin - 1993
Examples for Organic Chemistry and Structural Biology provides a fresh, practical guide to NMR for both students and practitioners, in a clearly written and non-mathematical format. It gives the reader an intermediate level theoretical basis for understanding laboratory applications, developing concepts gradually within the context of examples and useful experiments. Introduces students to modern NMR as applied to analysis of organic compounds. Presents material in a clear, conversational style that is appealing to students. Contains comprehensive coverage of how NMR experiments actually work. Combines basic ideas with practical implementation of the spectrometer. Provides an intermediate level theoretical basis for understanding laboratory experiments. Develops concepts gradually within the context of examples and useful experiments. Introduces the product operator formalism after introducing the simpler (but limited) vector model.

NMR Spectroscopy Explained - Neil E. Jacobsen - 2007-09-10
NMR Spectroscopy Explained : Simplified Theory, Applications and Examples for Organic Chemistry and Structural Biology provides a fresh, practical guide to NMR for both students and practitioners, in a clearly written and non-mathematical format. It gives the reader an intermediate level theoretical basis for understanding laboratory applications, developing concepts gradually within the context of examples and useful experiments. Introduces students to modern NMR as applied to analysis of organic compounds. Presents material in a clear, conversational style that is appealing to students. Contains comprehensive coverage of how NMR experiments actually work. Combines basic ideas with practical implementation of the spectrometer. Provides an intermediate level theoretical basis for understanding laboratory experiments. Develops concepts gradually within the context of examples and useful experiments. Introduces the product operator formalism after introducing the simpler (but limited) vector model.

Calcium-Binding Proteins in Health and Disease - Anthony Norman - 2012-12-02
Calcium-Binding Proteins in Health and Disease includes the papers prepared by the invited speakers as well as many of the free communications. The contributions are grouped according to their general subject matter, based on the classification made by the authors, e.g., Extracellular Metabolism: Calcium Homeostasis; Low-Affinity Calcium-Binding Proteins. There can be little doubt that calcium-binding proteins is a field of scientific endeavor which will continue to produce results of great interest to modern biology. This book is divided into eight sections, the first of which, tackle extracellular calcium metabolism or calcium homeostasis. The next sections focus on topics such as low-affinity calcium-binding proteins; calcium and membranes, channels and transport (pumps); the role of calcium in complex metabolic processes; and gene structure of calcium-binding proteins and their expression. Other chapters cover physical studies on calcium-binding proteins, including X-ray, crystallography, and NMR; structure-function relationships of calcium-binding proteins and their targets; and calcium-binding proteins in health and disease. This book will be of interest to practitioners in the fields of biology and medicine.

Basic One- and Two-dimensional NMR Spectroscopy - Horst Friebolin - 1993
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 techniques 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.

Guide to Fluorine NMR for Organic Chemists - William R. Dolbier - 2016-09-26
Following its well-received predecessor, this book offers an essential guide to chemists for understanding fluorine in spectroscopy. With over 1000 compounds and 100 spectra, the second edition adds new data – featuring fluorine effects on nitrogen NMR, chemical shifts, and coupling constants. • Explains how to successfully incorporate fluorine into target molecules and utilize fluorine substituents to structurally characterize organic compounds • Includes new data on nitrogen NMR, focusing on N-15, to portray the influence of fluorine upon nitrogen NMR chemical shifts and coupling constants • Expands on each chapter from the first edition with additional data and updated discussion from recent findings • "The flawless ordering of material covered in this stand-alone volume is such that information can be found very easily.” – Angewandte Chemie review of the first edition, 2010
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**Carbon-13 NMR of Flavonoids** - P.K. Agrawal - 2013-10-22

This detailed treatise is written for chemists who are not NMR spectroscopists but who wish to use carbon-13 NMR spectroscopy. It shows why measurement of carbon-13 NMR is needed and explains how the method can - or should - be used for rapid characterization of flavonoids, one of the most diverse and widespread groups of natural constituents. The first part of the book presents background information and discussion of the essential aspects of flavonoids and carbon-13 NMR spectroscopy and demonstrates its significant role in the revision of several earlier established chemical structures. It discusses various one- and two-dimensional NMR spectroscopic techniques and other relevant experimental methodologies for the interpretation of spectral details which enable individual resonance lines to be associated with the appropriate carbons in a molecule. The second part provides a comprehensive coverage of the carbon-13 chemical shifts of various classes and subclasses of flavonoids. It also illustrates how to utilize carbon-13 data to gain information for the determination of the nature, number and site of any substituent in flavonoids. Vital information for the differential and complete structure elucidation of the various classes of flavonoids by carbon-13 NMR shielding data is described in-depth in the third part of the book. The book will be welcomed by all those working in natural product chemistry who will appreciate the non-mathematical approach and the fact that such a wealth of theoretical and practical information has been assembled in a single volume.

**Magnetic Resonance in Food Science** - María Guðjónsdóttir - 2009-01-01

The term magnetic resonance covers a wide range of techniques, spectroscopy, relaxation and imaging. In turn, these areas are evolving and leading to various new applications of NMR and ESR in food science and nutrition. This book is part of the continuing series of proceedings of the biennial conferences on applications of magnetic resonance to food science. As always, the aim of the book is to bring the reader up-to-date with the state-of-the-art of the subject. The speakers came from Europe, North and South America, Asia and Australasia giving a global perspective to the event. The range of the conference was broad covering sensory science, authenticity, functionality, solid state methods and new methods. Magnetic Resonance in Food Science is a global survey written by leading authorities. It provides readers with an awareness of current activity in the field and why measurement of carbon-13 NMR is needed and explains how the method can - or should - be used for rapid characterization of flavonoids, one of the most diverse and widespread groups of natural constituents. The first part of the book presents background information and discussion of the essential aspects of flavonoids and carbon-13 NMR spectroscopy and demonstrates its significant role in the revision of several earlier established chemical structures. It discusses various one- and two-dimensional NMR spectroscopic techniques and other relevant experimental methodologies for the interpretation of spectral details which enable individual resonance lines to be associated with the appropriate carbons in a molecule. The second part provides a comprehensive coverage of the carbon-13 chemical shifts of various classes and subclasses of flavonoids. It also illustrates how to utilize carbon-13 data to gain information for the determination of the nature, number and site of any substituent in flavonoids. Vital information for the differential and complete structure elucidation of the various classes of flavonoids by carbon-13 NMR shielding data is described in-depth in the third part of the book. The book will be welcomed by all those working in natural product chemistry who will appreciate the non-mathematical approach and the fact that such a wealth of theoretical and practical information has been assembled in a single volume.
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The Assignment of the Absolute Configuration by NMR Using Chiral Derivatizing Agents - José Manuel Seco - 2015
The Assignment of the Absolute Configuration by NMR using Chiral Derivatizing Agents: A Practical Guide briefly explains the theoretical aspects necessary for understanding the methodology of new research in the field of Nuclear magnetic resonance spectroscopy (NMR).

Genomic and Personalized Medicine - - 2012-10-30
Genomic and Personalized Medicine, Second Edition — winner of a 2013 Highly Commended BMA Medical Book Award for Medicine — is a major discussion of the structure, history, and applications of the field, as it emerges from the campus and lab into clinical action. As with the first edition, leading experts review the development of the new science, the current opportunities for genome-based analysis in healthcare, and the potential of genomic medicine in future healthcare. The inclusion of the latest information on diagnostic testing, population screening, disease susceptibility, and pharmacogenomics makes this work an ideal companion for the many stakeholders of genomic and personalized medicine. With advancing knowledge of the genome across and outside protein-coding regions of DNA, new comprehension of genomic variation and frequencies across populations, the elucidation of advanced strategic approaches to genomic study, and above all in the elaboration of next-generation sequencing, genomic medicine has begun to achieve the much-vaunted transformative health outcomes of the Human Genome Project, almost a decade after its official completion in April 2003. Highly Commended 2013 BMA Medical Book Award for Medicine More than 100 chapters, from leading researchers, review the many impacts of genomic discoveries in clinical action, including 63 chapters new to this edition Discusses state-of-the-art genome technologies, including population screening, novel diagnostics, and gene-based therapeutics Wide and inclusive discussion encompasses the formidable ethical, legal, regulatory and social challenges related to the evolving practice of genomic medicine Clearly and beautifully illustrated with 280 color figures, and many thousands of references for further reading and deeper analysis
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Combines clear and concise discussions of key NMR concepts with succinct and illustrative examples Designed to cover a full course in Nuclear Magnetic Resonance (NMR) Spectroscopy, this text offers complete coverage of classic (one-dimensional) NMR as well as up-to-date coverage of two-dimensional NMR and other modern methods. It contains practical advice, theory, illustrated applications, and classroom-tested problems; looks at such important ideas as relaxation, NOEs, phase cycling, and processing parameters; and provides brief, yet fully comprehensible, examples. It also uniquely lists all of the general parameters for many experiments including mixing times, number of scans, relaxation times, and more. Nuclear Magnetic Resonance Spectroscopy: An Introduction to Principles, Applications, and Experimental Methods, 2nd Edition begins by introducing readers to NMR spectroscopy - an analytical technique used in modern chemistry, biochemistry, and biology that allows identification and characterization of organic, and some inorganic, compounds. It offers chapters covering: Experimental Methods; The Chemical Shift; The Coupling Constant; Further Topics in One-Dimensional NMR Spectroscopy; Two-Dimensional NMR Spectroscopy; Advanced Experimental Methods; and Structural Elucidation. Features classical analysis of chemical shifts and multi-pulse and multi-dimensional methods Contains experimental procedures and practical advice relative to the execution of NMR experiments Includes a chapter-long, worked-out problem that illustrates the application of nearly all current methods Offers appendices containing the theoretical basis of NMR, including the most modern approach that uses product operators and coherence-level diagrams By offering a balance between volumes aimed at NMR specialists and the structure-determination-only books that focus on synthetic organic chemists, Nuclear Magnetic Resonance Spectroscopy: An Introduction to Principles, Applications, and Experimental Methods, 2nd Edition is an excellent text for students and post-graduate students working in analytical and bio-sciences, as well as scientists who use NMR spectroscopy as a primary tool in their work.
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