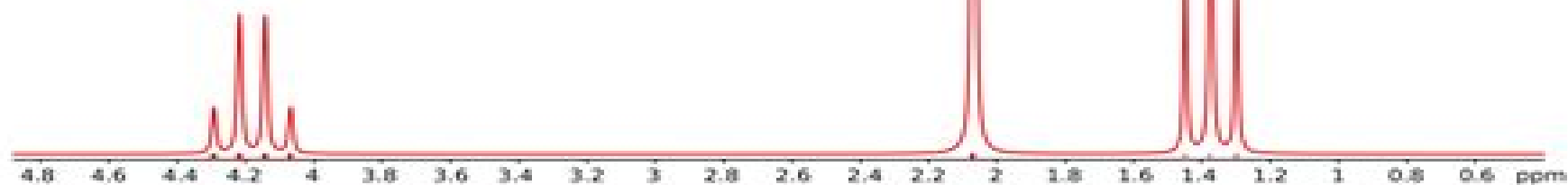
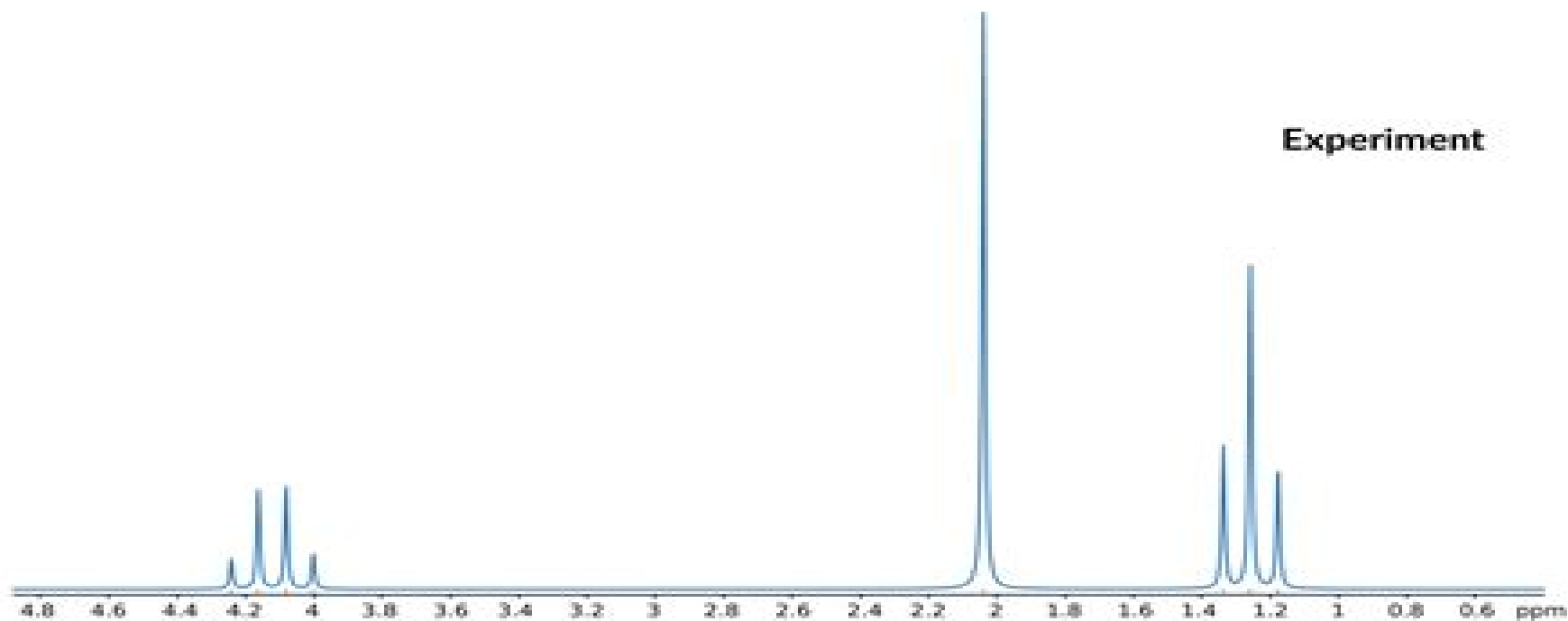


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Frank A. Bovey, Peter A. Mirau



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Spin-1 NMR N. Chandrakumar, 2012-12-06 Solid State NMR Klaus Müller, Marco Geppi, 2021-06-23 Solid State NMR

A thorough and comprehensive textbook covering the theoretical background experimental approaches and major applications of solid state NMR spectroscopy Nuclear Magnetic Resonance NMR spectroscopy is a powerful non destructive technique capable of providing information about the molecular structure and dynamics of molecules Alongside solution state NMR a well established technique to study chemical structures and investigate physico chemical properties of molecules in solutions solid state NMR SSNMR offers many exciting possibilities for the analysis of solid and soft materials across scientific fields SSNMR shows unique capabilities for a detailed investigation of structural and dynamic properties of materials over wide space and time ranges For this reason and thanks to significant advances in the past several years the application of SSNMR to materials is rapidly increasing in disciplines such as chemistry physics and materials and life sciences Solid State NMR Principles Methods and Applications offers a systematic introduction to the theory methodological concepts and major experimental methods of SSMR spectroscopy Exploring the unique potential of SSNMR for the structural and dynamic characterization of soft and either amorphous or crystalline solid materials this comprehensive textbook provides foundational knowledge and recent developments of SSNMR covering physical and theoretical background experimental methods and applications to pharmaceuticals polymers inorganic and hybrid materials liquid crystals and model membranes Written by two expert authors to ensure a clear and consistent presentation of the subject this textbook Includes a brief introduction to the historical aspects and broad theoretical background of solid state NMR spectroscopy Provides helpful illustrations to explain the various SSNMR concepts and methods Features accessible descriptive text with self consistent use of quantum mechanics Covers the experimental aspects of SSNMR spectroscopy and in particular a description of many useful pulse sequences Contains references to relevant literature Solid State NMR Principles Methods and Applications is the ideal textbook for university courses on SSNMR advanced spectroscopies and a valuable single volume reference for spectroscopists chemists and researchers in the field of materials *Nuclear Magnetic Resonance* G A Webb, 2007-10-31 As a spectroscopic method nuclear magnetic resonance NMR has seen spectacular growth over the past two decades both as a technique and in its applications Today the applications of NMR span a wide range of scientific disciplines from physics to biology to medicine Each volume of Nuclear Magnetic Resonance comprises a combination of annual and biennial reports which together provide comprehensive coverage of the literature on this topic This Specialist Periodical Report reflects the growing volume of published work involving NMR techniques and applications in particular NMR of natural macromolecules which is covered in two reports NMR of Proteins and Nucleic Acids and NMR of Carbohydrates Lipids and Membranes For those wanting to become rapidly acquainted with specific areas of NMR this title provides unrivalled scope of coverage Seasoned practitioners of NMR will find this an invaluable source of current methods

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Multinuclear Solid-State Nuclear Magnetic Resonance of Inorganic Materials Kenneth J.D. MacKenzie,M.E. Smith,2002-04-26 Techniques of solid state nuclear magnetic resonance NMR spectroscopy are constantly being extended to a more diverse range of materials pressing into service an ever expanding range of nuclides including some previously considered too intractable to provide usable results At the same time new developments in both hardware and software are being introduced and refined This book covers the most important of these new developments With sections addressed to non specialist researchers providing accessible answers to the most common questions about the theory and practice of NMR asked by novices as well as a more specialised and up to date treatment of the most important areas of inorganic materials research to which NMR has application this book should be useful to NMR users whatever their level of expertise and whatever inorganic materials they wish to study **Nuclear Magnetic Resonance Spectroscopy** Frank A. Bovey,Peter A. Mirau,H. S. Gutowsky,1988-11-01 Nuclear Magnetic Resonance Spectroscopy Second Edition focuses on two dimensional nuclear magnetic resonance NMR spectroscopy high resolution NMR of solids water suppression multiple quantum spectroscopy and NMR imaging The selection first takes a look at the fundamental principles and experimental methods Discussions focus on the NMR phenomenon dipolar broadening and spin spin relaxation nuclear electric quadrupole relaxation saturation magnetic shielding and chemical shift magnetic field transitions between the nuclear energy levels and resolution and sensitivity considerations The manuscript then ponders on chemical shift coupling of nuclear spins and nuclear relaxation and chemical rate processes Topics include spin lattice relaxation spin spin relaxation spin decoupling and

associated techniques and description and analysis of spin systems The text examines two dimensional NMR spectroscopy macromolecules and NMR of solids including magic angle spinning cross polarization proton dipolar broadening biopolymers and chain motion in macromolecules The selection is a valuable source of data for readers interested in nuclear magnetic resonance spectroscopy

NMR Crystallography Robin K. Harris, Roderick E. Wasylshen, Melinda J. Duer, 2012-12-19 The content of this volume has been added to eMagRes formerly Encyclopedia of Magnetic Resonance the ultimate online resource for NMR and MRI The term NMR Crystallography has only recently come into common usage and even now causes raised eyebrows within some parts of the diffraction community The power of solid state NMR to give crystallographic information has considerably increased since the CPMAS suite of techniques was introduced in 1976 In the first years of the 21st century the ability of NMR to provide information to support and facilitate the analysis of single crystal and powder diffraction patterns has become widely accepted Indeed NMR can now be used to refine diffraction results and in favorable cases to solve crystal structures with minimal or even no diffraction data The increasing ability to relate chemical shifts including the tensor components to the crystallographic location of relevant atoms in the unit cell via computational methods has added significantly to the practice of NMR crystallography Diffraction experts will increasingly welcome NMR as an allied technique in their structural analyses Indeed it may be that in the future crystal structures will be determined by simultaneously fitting diffraction patterns and NMR spectra This Handbook is organised into six sections The first contains an overview and some articles on fundamental NMR topics followed by a section concentrating on chemical shifts and one on coupling interactions The fourth section contains articles describing how NMR results relate to fundamental crystallography concepts and to diffraction methods The fifth section concerns specific aspects of structure such as hydrogen bonding Finally four articles in the sixth section give applications of NMR crystallography to structural biology organic pharmaceutical chemistry inorganic materials chemistry and geochemistry

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Cross-relaxation

and Cross-correlation Parameters in NMR Daniel Canet, 2017-10-18 Spin relaxation parameters although difficult to interpret are attracting interest in NMR as these parameters are capable of yielding both structural and dynamic information. Cross relaxation and cross correlation parameters afford a non ambiguous approach to molecular structure and dynamics although they require some special skills for their experimental determination and for their exploitation. This work will start with an introduction to nuclear spin cross relaxation and cross correlation phenomena in liquids then look in more detail at molecules in soft matter and large biomolecules. Providing a detailed timely account the authors are filling a gap in the present NMR literature for the analytical scientist.

NMR of Polymers Frank A. Bovey, Peter A. Mirau, 1996-11-19 NMR has made important contributions to our understanding of structure property relationships in polymers. This book provides an up to date and comprehensive overview of the fundamentals of NMR with applications of multidimensional NMR and the new solution and solid state methods in polymer science. *NMR of Polymers* is written by leading authorities for graduate students and professionals in academia and industry. Provides comprehensive overview of NMR in Polymer Science. Covers multidimensional NMR. Includes new solution and solid state methods. Addresses chain conformation and dynamics.

Nuclear Magnetic Resonance P. J. Hore, 2015 Nuclear Magnetic Resonance offers an accessible introduction to the physical principles of liquid state NMR with examples, applications and exercises provided throughout to enable beginning undergraduates to get to grips with this important analytical technique.

Statics and Dynamics of Weakly Coupled Antiferromagnetic Spin-1/2 Ladders in a Magnetic Field Pierre Bouillot, 2012-12-14 This thesis shows how a combination of analytic and numerical techniques such as a time dependent and finite temperature Density Matrix Renormalization Group (DMRG) technique can be used to obtain the physical properties of low dimensional quantum magnets with an unprecedented level of accuracy. A comparison between the theory and experiment then enables these systems to be used as quantum simulators for example to test various generic properties of low dimensional systems such as Luttinger liquid physics, the paradigm of one dimensional interacting quantum systems. Application of these techniques to a material made of weakly coupled ladders (BPCB) allowed the first quantitative test of Luttinger liquids. In addition other physical quantities (magnetization, specific heat, etc.) and more remarkably the spins spin correlations directly measurable in neutron scattering experiments were in excellent agreement with the observed quantities. We thus now have tools to quantitatively assess the dynamics for this class of quantum systems.

Nuclear Magnetic Resonance of Liquid Crystals Ronald Y. Dong, 2012-12-06 Liquid crystals have become ubiquitous in the displays for electronic devices ranging from wrist watches to laptop computers. Nuclear magnetic resonance has become one of the important techniques for determining their structures and properties. Intended for researchers and students in physics, chemistry and materials science, this book provides the necessary background information and sufficient mathematical and physical detail to study the current research literature. The book begins with a survey of liquid crystal phases and field effects and with an introduction to the basic

physics of nuclear magnetic resonance it then discusses orientational ordering and molecular field theories for various liquid crystal molecules and NMR studies of uniaxial and biaxial phases Subsequent chapters consider spin relaxation processes using a semiclassical approach and rotational translational and internal molecular dynamics of liquid crystals The final chapter discusses two dimensional and multiple quantum NMR spectroscopies and their application in elucidating liquid crystal properties This second edition updated throughout incorporates many new references corrects typographical errors and includes new mathematical appendices

Functionalized Inorganic Fluorides Alain Tressaud,2010-04-09

Functionalized Inorganic Fluorides Synthesis Characterization physical chemical characterizations including morphology structure spectroscopic and optical behaviour detailed ab initio investigations and simulations and last but not least potential applications

New Advances in Analytical Chemistry Atta-ur- Rahman,2000 Presenting recent developments in various spectroscopic techniques such as NMR Spectroscopy mass spectroscopy etc in the form of comprehensive reviews written by leading authorities in the field This monograph should prove exceedingly useful to both research students and postdoctoral workers who wish to keep abreast with frontiers in analytical techniques

Advances in Magnetic Resonance John S. Waugh,2013-10-22 Advances in Magnetic Resonance Volume 12 presents a variety of contributions to the theory and practice of magnetic resonance The book contains six chapters and begins with a discussion of diffusion and self diffusion measurements by nuclear magnetic resonance This is followed by separate chapters on spin lattice relaxation time in hydrogen isotope mixtures the principles of optical detection of nuclear spin alignment and nuclear quadrupole resonance and the spin 1 behavior including the relaxation of the quasi invariants of the motion of a system of pairs of dipolar coupled spin 1 2 nuclei Subsequent chapters deal with the development and application of crafted pulse shapes in nuclear magnetic resonance magnetic resonance imaging and optical coherent transient laser spectroscopies and the application of pulsed proton nuclear magnetic resonance broad line spectroscopy as a thermal analysis technique and its use to study thermal transformations in hydrogen containing solids in particular coals and related organic materials

Annual Reports on NMR Spectroscopy Graham A. Webb,2010-10-27 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 Provides updates on the latest developments in NMR spectroscopy Includes comprehensive review articles Highlights the increasing importance of NMR spectroscopy as a technique for structural determination

Diversities in Quantum Computation and Quantum Information Mikio Nakahara,2013 This book is a collection of lecture notes and contributions in Summer School on Diversities in Quantum Computation Information held on 1

5 August 2010 at U Community Hotel Higashi Osaka Japan Lecturers are world class authorities in respective areas in quantum information and quantum computing including physics mathematics chemistry and information science They lectured on cutting edge research frontiers where they are currently working including quantum error correction relativistic quantum information quantum computing of link polynomials quantum algorithms etc Each lecture note is written in a self contained manner so that it may be used as a textbook for one semester graduate course or advanced undergraduate course Contributions report current research subjects also in a self contained manner We believe that these articles are accessible to the readers form various disciplines Advances in Magnetic and Optical Resonance Warren S. Warren,2013-10-22

Advances in Magnetic and Optical Resonance Volume 17 reviews different developing branches of coherent spectroscopy focusing on the incoherent radiation pulses in optics and magnetic resonance This book is divided into two chapters Chapter 1 summarizes the uses and occasional advantages of incoherent radiation pulses in optics and magnetic resonance The second chapter reviews theoretical developments in zero field NMR and ESR spectroscopies Other topics include the nonlinear incoherent spectroscopy stochastic nonlinear susceptibilities nonlinear interferometer for magnetic resonance and nonlinear interference and optics The zero field spin dynamics and relaxation and ZF line shapes in the presence of molecular reorientations are also covered This publication is a good reference for students and researchers interested in coherent spectroscopy **Nuclear Magnetic Resonance** Paul Hodgkinson,Josep Sauri,2024-11-15 The success of NMR

and its constant redevelopment mean that the literature is vast and wide ranging This volume contains chapters which distil the key recent literature in different areas covering the spectrum of NMR theory and practice including theory and computation of nuclear shielding theoretical and practical aspects of indirect spin spin couplings and nuclear spin relaxation With applications across chemistry physics and medicine nuclear magnetic resonance is a proven uniquely versatile and powerful spectroscopic technique and other chapters on NMR in soft matter NMR of proteins and nucleic acids and NMR in living systems provide accounts of its versatility All the reports in this volume are invaluable both for new researchers wishing to engage with literature for the first time and for seasoned practitioners particularly service managers needing to keep in touch with the ever expanding ways in which NMR is used Modern Magnetic Resonance Graham A.

Webb,2007-05-26 Modern Magnetic Resonance provides a unique and comprehensive resource on up to date uses and applications of magnetic resonance techniques in the sciences including chemistry biology materials food medicine pharmaceuticals and marine sciences The widespread appeal of MMR methods for revealing information at the molecular and microscopic levels is noted and examples are provided from the chemical and other sciences Until now there has been no single publication that covers all the areas encompassed by Modern Magnetic Resonance by bringing together the various techniques and their applications in many scientific areas the internationally renowned Editors have created a resource of broad appeal to the scientific community The book includes High resolution solid and liquid state NMR Low resolution NMR

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