

# Handbook Of Applied Solid State Spectroscopy

[Solid-State Spectroscopy](#) [Introduction to Solid-State NMR Spectroscopy](#) [Handbook of Applied Solid State Spectroscopy](#) [Solid-State Spectroscopy](#) [Handbook of Applied Solid State Spectroscopy](#) **Many-body Aspects of Solid State Spectroscopy** [Solid State NMR Spectroscopy](#) [Spectroscopy of Solid-State Laser-Type Materials](#) [Solid State NMR](#) [Modern Methods in Solid-state NMR](#) [X-Ray Spectroscopy in Atomic and Solid State Physics](#) [Optical Properties of Solids](#) [X-Ray Spectroscopy in Atomic and Solid State Physics](#) **Optical Spectroscopy of Inorganic Solids** [Modulation Spectroscopy](#) [Spectroscopy of Solid-State Laser-Type Materials](#) [Solid-State NMR in Zeolite Catalysis](#) [NMR Spectroscopy in Liquids and Solids](#) [Multinuclear Solid-State Nuclear Magnetic Resonance of Inorganic Materials](#) [NMR Spectroscopy of Polymers in Solution and in the Solid State](#) [Introduction to Solid-State NMR Spectroscopy](#) [Spectroscopy of Solid-state Laser and Luminescent Materials](#) [Spectroscopy of Solid-State Laser-Type Materials](#) [An Introduction to the Optical Spectroscopy of Inorganic Solids](#) **Muon Spin Rotation Spectroscopy Principles and Applications in Solid State Physics** [Advances in Biological Solid-State NMR](#) [Handbook of Spectroscopy Characterisation Methods in Solid State and Materials Science](#) [Solid State Physics](#) **Ultrafast Spectroscopy of Semiconductors and Semiconductor Nanostructures** [Metal Oxide Nanoparticles, 2 Volume Set](#) [Solid State Development and Processing of Pharmaceutical Molecules](#) [Spectroscopic Analyses](#) [Photoelectron Spectroscopy](#) [Solid State Theory](#) [Solid-state NMR](#) [Solid-State Physics](#) [Physics of Solid-State Laser Materials](#) [Understanding Solid State Physics](#) **Fundamentals of Solid State Engineering**

Getting the books **Handbook Of Applied Solid State Spectroscopy** now is not type of challenging means. You could not only going subsequently ebook stock or library or borrowing from your connections to admission them. This is an no question simple means to specifically acquire lead by on-line. This online statement Handbook Of Applied Solid State Spectroscopy can be one of the options to accompany you taking into account having other time.

It will not waste your time. agree to me, the e-book will unconditionally freshen you supplementary thing to read. Just invest little grow old to contact this on-line publication **Handbook Of Applied Solid State Spectroscopy** as skillfully as evaluation them wherever you are now.

[Metal Oxide Nanoparticles, 2 Volume Set](#) Mar 28 2020 Metal Oxide Nanoparticles A complete nanoparticle resource for chemists and industry professionals Metal oxide nanoparticles are integral to a wide range of natural and technological processes—from mineral transformation to electronics. Additionally, the fields of engineering, electronics, energy technology, and electronics all utilize metal oxide nanoparticle powders. Metal Oxide Nanoparticles: Formation, Functional Properties, and Interfaces presents readers with the most relevant synthesis and formulation approaches for using metal oxide nanoparticles as functional materials. It covers common processing routes and the assessment of physical and chemical particle properties through comprehensive and complementary characterization methods. This book will serve as an introduction to nanoparticle formulation, their interface chemistry and functional properties at the nanoscale. It will also act as an in-depth resource, sharing detailed information on advanced approaches to the physical, chemical, surface, and interface characterization of metal oxide nanoparticle powders and dispersions. Addresses the application of metal oxide nanoparticles and its economic impact Examines particle synthesis, including the principles of selected bottom-up strategies Explores nanoparticle formulation—a selection of processing and application routes Discusses the significance of particle surfaces and interfaces on structure formation, stability and functional materials properties Covers metal oxide nanoparticle characterization at different length scales With this valuable resource, academic researchers, industrial chemists, and PhD students can all gain insight into the synthesis, properties, and applications of metal oxide nanoparticles.

**Optical Spectroscopy of Inorganic Solids** Sep 14 2021 This text describes the technique of optical spectroscopy applied to problems in condensed matter physics. It relates theoretical understanding to experimental measurement, including discussion of the optical spectroscopy of inorganic insulators, with many illustrative examples. Symmetry arguments are developed from a formal group theoretical basis and are frequently used, and a special effort is made to treat the subject of lattice vibrations and to show how these can affect the spectroscopic properties of solids. The elements of laser theory are developed, and the authors also explore the use of optically detected magnetic resonance techniques for the investigation of semiconducting materials.

**Many-body Aspects of Solid State Spectroscopy** May 22 2022

[Spectroscopy of Solid-State Laser-Type Materials](#) Mar 20 2022 This book presents an account of the course "Spectroscopy of Solid-State Laser-Type Materials" held in Erice, Italy, from June 16 to 30, 1985. This meeting was organized by the International School of Atomic and Molecular Spectroscopy of the "Ettore Majorana" Centre for Scientific Culture. The objective of the course was to present and examine the recent advances in spectroscopy and theoretical modelling relevant to the interpretation of luminescence and laser phenomena in several classes of solid-state materials. The available solid-state matrices (e.g. halides, oxides, glasses, semiconductors) and the full range of possible activators (transition ions, rare earth ions, post-transition ions, actinides, color centres) were considered. By bringing together specialists in the fields of solid-state luminescence and of solid-state laser materials, this course provided a much-needed forum for the critical . assessment of past developments in the R&D of solid-state lasers. Additional objectives of the meeting were to identify new classes of host/activator systems that show promise of laser operation; to alert researchers in solid-state luminescence to current technological needs for solid-state tunable lasers operating in the visible and infrared spectral regions; and generally to provide the scientific background for advanced work in solid state lasers. A total of 71 participants came from 54 laboratories and 21 nations (Austria, Belgium, Canada, F.R. of Germany, France, Greece, Ireland, Israel, Italy, the Netherlands, P.R. of China, Poland, Rumania, Sweden, Switzerland, South Korea, Spain, Turkey, United Kingdom, U.S.A. and U.S.S.R.).

**Fundamentals of Solid State Engineering** Jun 18 2019 Provides a multidisciplinary introduction to quantum mechanics, solid state physics, advanced devices, and fabrication Covers wide range of topics in the same style and in the same notation Most up to date developments in semiconductor physics and nano-engineering Mathematical derivations are carried through in detail with emphasis on clarity Timely application areas such as biophotonics , bioelectronics

[Solid State Physics](#) May 30 2020 Intended for a two semester advanced undergraduate or graduate course in Solid State Physics, this treatment offers modern coverage of the theory and related experiments, including the group theoretical approach to band structures, Moessbauer recoil free fraction, semi-classical electron theory, magnetoconductivity, electron self-energy and Landau theory of Fermi liquid, and both quantum and fractional quantum Hall effects. Integrated throughout are developments from the newest semiconductor devices, e.g. space charge layers, quantum wells and superlattices. The first half includes all material usually covered in the introductory course, but in greater depth than most introductory textbooks.

The second half includes most of the important developments in solid-state researches of the past half century, addressing e.g. optical and electronic properties such as collective bulk and surface modes and spectral function of a quasiparticle, which is a basic concept for understanding LEED intensities, X ray fine structure spectroscopy and photoemission. So both the fundamental principles and most recent advances in solid state physics are explained in a class-tested tutorial style, with end-of-chapter exercises for review and reinforcement of key concepts and calculations.

[Multinuclear Solid-State Nuclear Magnetic Resonance of Inorganic Materials](#) Apr 09 2021 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.

[Understanding Solid State Physics](#) Jul 20 2019 The goal of solid state physics is to find the correlation between the microscopic composition of solids and their macroscopic (electrical, optical, thermal) properties. There are many good books that provide clear explanations and have made solid state physics look easier. However, clear explanations do not necessarily involve complete understanding, and the best test for the reader is to try an alternative point of view: solve exercises or

problems. The aim of this textbook is to teach solid state physics by challenging the readers through exercises and their worked solutions. The magnitude of the numerical applications will provide learners the opportunity to make useful errors and to learn by drawing figures and graphs. Simple questions that are free of mathematical considerations are given at the end of each chapter to be solved by common sense and will permit another view of the subject.

**Modern Methods in Solid-state NMR** Jan 18 2022 Solid-state NMR covers an enormous range of material types and experimental techniques. Although the basic instrumentation and techniques of solids NMR are readily accessible, there can be significant barriers, even for existing experts, to exploring the bewildering array of more sophisticated techniques. In this unique volume, a range of experts in different areas of modern solid-state NMR explain about their area of expertise, emphasising the “practical aspects” of implementing different techniques, and illustrating what questions can and cannot be addressed. Later chapters address complex materials, showing how different NMR techniques discussed in earlier chapters can be brought together to characterise important materials types. The volume as a whole focusses on topics relevant to the developing field of “NMR crystallography” – the use of solids NMR as a complement to diffraction crystallography. This book is an ideal complement to existing introductory texts and reviews on solid-state NMR. New researchers wanting to understand new areas of solid-state NMR will find each chapter to be the equivalent to spending time in the laboratory of an internationally leading expert, learning the hints and tips that make the difference between knowing about a technique and being ready to put it into action. With no equivalent on the market, it will be of interest to every solid-state NMR researcher (academic and postgraduate) working in the chemical sciences.

**Solid-State Physics** Sep 21 2019 While the standard solid state topics are covered, the basic ones often have more detailed derivations than is customary (with an emphasis on crystalline solids). Several recent topics are introduced, as are some subjects normally included only in condensed matter physics. Lattice vibrations, electrons, interactions, and spin effects (mostly in magnetism) are discussed the most comprehensively. Many problems are included whose level is from "fill in the steps" to long and challenging, and the text is equipped with references and several comments about experiments with figures and tables.

**Solid State NMR** Feb 19 2022 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 SSNMR 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.

**Ultrafast Spectroscopy of Semiconductors and Semiconductor Nanostructures** Apr 28 2020 Ultrafast spectroscopy of semiconductors and semiconductor nanostructures is currently one of the most exciting areas of research in condensed-matter physics. Remarkable recent progress in the generation of tunable femtosecond pulses has allowed direct investigation of the most fundamental dynamical processes in semiconductors. This second edition presents the most striking recent advances in the techniques of ultrashort pulse generation and ultrafast spectroscopy; it discusses the physics of relaxation, tunneling and transport dynamics in semiconductors and semiconductor nanostructures following excitation by femtosecond laser pulses.

**Spectroscopy of Solid-State Laser-Type Materials** Dec 05 2020 This book presents an account of the course "Spectroscopy of Solid-State Laser-Type Materials" held in Erice, Italy, from June 16 to 30, 1985. This meeting was organized by the International School of Atomic and Molecular Spectroscopy of the "Ettore Majorana" Centre for Scientific Culture. The objective of the course was to present and examine the recent advances in spectroscopy and theoretical modelling relevant to the interpretation of luminescence and laser phenomena in several classes of solid-state materials. The available solid-state matrices (e.g. halides, oxides, glasses, semiconductors) and the full range of possible activators (transition ions, rare earth ions, post-transition ions, actinides, color centres) were considered. By bringing together specialists in the fields of solid-state luminescence and of solid-state laser materials, this course provided a much-needed forum for the critical assessment of past developments in the R&D of solid-state lasers. Additional objectives of the meeting were to identify new classes of host/activator systems that show promise of laser operation; to alert researchers in solid-state luminescence to current technological needs for solid-state tunable lasers operating in the visible and infrared spectral regions; and generally to provide the scientific background for advanced work in solid state lasers. A total of 71 participants came from 54 laboratories and 21 nations (Austria, Belgium, Canada, F.R. of Germany, France, Greece, Ireland, Israel, Italy, the Netherlands, P.R. of China, Poland, Rumania, Sweden, Switzerland, South Korea, Spain, Turkey, United Kingdom, U.S.A. and U.S.S.R.).

**Photoelectron Spectroscopy** Dec 25 2019 An up-to-date introduction to the field, treating in depth the electronic structures of atoms, molecules, solids and surfaces, together with brief descriptions of inverse photoemission, spin-polarized photoemission and photoelectron diffraction. Experimental aspects are considered throughout and the results carefully interpreted by theory. A wealth of measured data is presented in tabular form for easy use by experimentalists.

**Physics of Solid-State Laser Materials** Aug 21 2019 This book discusses the spectral properties of solid-state laser materials, including emission and absorption of light, the law of radiative and nonradiative transitions, the selection rule for optical transitions, and different calculation methods of the spectral parameters. The book includes a systematic presentation of the authors' own research works in this field, specifically addressing the stimulated nonradiative transition theory and the apparent crystal field model. This volume is helpful resource for researchers and graduate students in the fields of solid spectroscopy and solid-state laser material physics, while also serving as a valuable reference guide for instructors and advanced students of physics.

**NMR Spectroscopy of Polymers in Solution and in the Solid State** Mar 08 2021 NMR Spectroscopy of Polymers in Solution and in the Solid State provides reviews and original papers on the use of nuclear magnetic resonance (NMR) spectroscopy for polymers. Both synthetic and natural polymers are covered. This book also discusses both solution and solid state NMR.

**Solid-State Spectroscopy** Oct 27 2022 This text is an introductory compilation of basic concepts, methods and applications in the field of spectroscopy. It discusses new radiation sources such as lasers and synchrotrons and describes the linear response together with the basic principles and the technical background for various scattering experiments.

**Introduction to Solid-State NMR Spectroscopy** Feb 07 2021

**Muon Spin Rotation Spectroscopy Principles and Applications in Solid State Physics** Oct 03 2020

**Solid State NMR Spectroscopy** Apr 21 2022 This book is for those familiar with solution-state NMR who are encountering solid-state NMR for the first time. It presents the current understanding and applications of solid-state NMR with a rigorous but readable approach, making it easy for someone who merely wishes to gain an overall impression of the subject without details. This dual requirement is met through careful construction of the material within each chapter. The book is divided into two parts: "Fundamentals" and "Further Applications." The section on Fundamentals contains relatively long chapters that deal with the basic theory and practice of solid-state NMR. The essential differences and extra scope of solid-state NMR over solution-state is dealt with in an introductory chapter. The basic techniques that all chapters rely on are collected into a second chapter to avoid unnecessary repetition later. Remaining chapters in the "Fundamentals" part deal with the major areas of solid-state NMR which all solid-state NMR spectroscopists should know about. Each begins with an overview of the topic that puts the chapter in context. The basic principles upon which the techniques in the chapter rely are explained in a separate section. Each of these chapters exemplifies the principles and techniques with the applications most commonly found in current practice. The "Further Applications" section contains a series of shorter chapters which describe the NMR techniques used in other, more specific areas. The basic principles upon which these techniques rely will be expounded only if not already in the Fundamentals part.

**NMR Spectroscopy in Liquids and Solids** May 10 2021 NMR Spectroscopy in Liquids and Solids provides an introduction of the general concepts behind Nuclear Magnetic Resonance (NMR) and its applications, including how to perform adequate NMR experiments and interpret data collected in liquids and solids to characterize molecule systems in terms of their structure and dynamics. The book is composed of ten chapters. The first three chapters consider the theoretical basis of NMR spectroscopy, the theory of NMR relaxation, and the practice of relaxation measurements. The middle chapters discuss the general aspects of molecular dynamics and their relationships to NMR, NMR spectroscopy and relaxation studies in solutions, and special issues related to NMR in solutions. The remaining chapters introduce general principles and strategies involved in solid-state NMR studies, provide examples of applications of relaxation for the determination of molecular dynamics in diamagnetic solids, and discuss special issues related to solid state NMR— including NMR relaxation in paramagnetic solids. All chapters are accompanied by references and recommended literature for further reading. Many practical

examples of multinuclear NMR and relaxation experiments and their interpretations are also presented. The book is ideal for scientists new to NMR, students, and investigators working in the areas of chemistry, biochemistry, biology, pharmaceutical sciences, or materials science.

**Introduction to Solid-State NMR Spectroscopy** Sep 26 2022 Introduction to Solid State NMR Spectroscopy is written for undergraduate and graduate students of chemistry, either taking a course in advanced or solid-state nuclear magnetic resonance spectroscopy or undertaking research projects where solid-state NMR is likely to be a major investigative technique. It will also serve as a practical introduction in industry, where the techniques can provide new or complementary information to supplement other investigative techniques. By covering solid-state NMR spectroscopy in a clear, straightforward and approachable way with detailed descriptions of the major solid-state NMR experiments focussing on what the experiments do and what they tell the researcher, this book will serve as an ideal introduction to the subject. These descriptions are backed up by separate mathematical explanations for those who wish to gain a more sophisticated quantitative understanding of the phenomena. With additional coverage of the practical implementation of solid-state NMR experiments integrated into the discussion, this book will be essential reading for all those using, or about to use, solid-state NMR spectroscopy. Dr Melinda Duer is a senior lecturer in the Department of Chemistry at the University of Cambridge, Cambridge, UK.

**Spectroscopy of Solid-State Laser-Type Materials** Jul 12 2021 This book presents an account of the course "Spectroscopy of Solid-State Laser-Type Materials" held in Erice, Italy, from June 16 to 30, 1985. This meeting was organized by the International School of Atomic and Molecular Spectroscopy of the "Ettore Majorana" Centre for Scientific Culture. The objective of the course was to present and examine the recent advances in spectroscopy and theoretical modelling relevant to the interpretation of luminescence and laser phenomena in several classes of solid-state materials. The available solid-state matrices (e.g. halides, oxides, glasses, semiconductors) and the full range of possible activators (transition ions, rare earth ions, post-transition ions, actinides, color centres) were considered. By bringing together specialists in the fields of solid-state luminescence and of solid-state laser materials, this course provided a much-needed forum for the critical assessment of past developments in the R&D of solid-state lasers. Additional objectives of the meeting were to identify new classes of host/activator systems that show promise of laser operation; to alert researchers in solid-state luminescence to current technological needs for solid-state tunable lasers operating in the visible and infrared spectral regions; and generally to provide the scientific background for advanced work in solid state lasers. A total of 71 participants came from 54 laboratories and 21 nations (Austria, Belgium, Canada, F.R. of Germany, France, Greece, Ireland, Israel, Italy, the Netherlands, P.R. of China, Poland, Rumania, Sweden, Switzerland, South Korea, Spain, Turkey, United Kingdom, U.S.A. and U.S.S.R.).

**Spectroscopic Analyses** Jan 26 2020 The book presents developments and applications of these methods, such as NMR, mass, and others, including their applications in pharmaceutical and biomedical analyses. The book is divided into two sections. The first section covers spectroscopic methods, their applications, and their significance as characterization tools; the second section is dedicated to the applications of spectrophotometric methods in pharmaceutical and biomedical analyses. This book would be useful for students, scholars, and scientists engaged in synthesis, analyses, and applications of materials/polymers.

*X-Ray Spectroscopy in Atomic and Solid State Physics* Oct 15 2021 The fields of X-Ray Spectroscopy in Atomic and Solid State Physics have undergone spectacular growth, sometimes rather anarchic, during the past decade. The old mold of X-ray spectroscopy has been burst, and this ASI provided an in-depth exploration of theory and recently developed techniques; however, some work still needs to be done to create a new frame and reduce anarchy in the field. The purpose of this Institute was to gather atomic and solid state physicists working in theoretical and new experimental techniques recently developed. The lectures were concerned with, among others, the following fields: theory of X-ray near-edge structure, XPS and AES with conventional and synchrotron radiation sources, PIXE, EXAFS, SEXAFS, XRF, SXS, and molecular spectroscopy. The Institute considered in detail some of these experimental techniques and the pertinent theoretical interpretations by selecting an important list of lectures which summarize the scientific contents of the ASI. The truly international character of this NATO ASI, its size, and the high quality of the lecturers contributed to make this school a very fruitful scientific meeting. Two to four general lectures were given each working day and three afternoons were reserved for presentation of current work in the form of posters. We think that these poster presentations reflect the current research work of the participants.

**Solid-State Spectroscopy** Jul 24 2022 Spectroscopic methods have opened up a new horizon in our knowledge of solid-state materials. Numerous techniques using electromagnetic radiation or charged and neutral particles have been invented and worked out to a high level in order to provide more detailed information on the solids. In this text, new radiation sources like lasers and synchrotrons are discussed. It provides a description of the linear response together with the basic principles and the technical background for various scattering experiments. Fourier transform spectroscopy, pulsed and magnetic NMR techniques, photo-emission, and light and electron scattering are elucidated. Each chapter includes problems. The concept of this textbook is designed for graduate students.

**Handbook of Applied Solid State Spectroscopy** Aug 25 2022 Solid-State spectroscopy is a burgeoning field with applications in many branches of science, including physics, chemistry, biosciences, surface science, and materials science. This handbook brings together in one volume information about various spectroscopic techniques that is currently scattered in the literature of these disciplines. This concise yet comprehensive volume covers theory and applications of a broad range of spectroscopies. It provides an overview of sixteen spectroscopic technique and self-contained chapters present up-to-date scientific and technical information and references with minimal overlap and redundancy.

*X-Ray Spectroscopy in Atomic and Solid State Physics* Dec 17 2021 The fields of X-Ray Spectroscopy in Atomic and Solid State Physics have undergone spectacular growth, sometimes rather anarchic, during the past decade. The old mold of X-ray spectroscopy has been burst, and this ASI provided an in-depth exploration of theory and recently developed techniques; however, some work still needs to be done to create a new frame and reduce anarchy in the field. The purpose of this Institute was to gather atomic and solid state physicists working in theoretical and new experimental techniques recently developed. The lectures were concerned with, among others, the following fields: theory of X-ray near-edge structure, XPS and AES with conventional and synchrotron radiation sources, PIXE, EXAFS, SEXAFS, XRF, SXS, and molecular spectroscopy. The Institute considered in detail some of these experimental techniques and the pertinent theoretical interpretations by selecting an important list of lectures which summarize the scientific contents of the ASI. The truly international character of this NATO ASI, its size, and the high quality of the lecturers contributed to make this school a very fruitful scientific meeting. Two to four general lectures were given each working day and three afternoons were reserved for presentation of current work in the form of posters. We think that these poster presentations reflect the current research work of the participants.

**Spectroscopy of Solid-state Laser and Luminescent Materials** Jan 06 2021 Solid-state laser and luminescent materials activated by rare-earth or transition metals ions are widely used for solid-state lasers, luminescent lamps, flat displays, optical fibre communication systems, and other photonic devices. The unique solid-state electronic properties enable the activators in solids to emit photons efficiently in visible and IR regions. The rapid advances in both materials science and optoelectronics, particularly, the development of new methods of material synthesis and device fabrication, have been stimulating the growing interests in the deep insights of spectroscopic properties of solid-state laser and luminescent materials. This book brings together essential and practical knowledge of spectroscopic physics. This includes, atomic spectroscopy, mathematical theory, rare earth ions in materials, light emission and absorption, spectral properties, non-radiative transitions and energy migration.

**Solid State Development and Processing of Pharmaceutical Molecules** Feb 25 2020 Solid State Development and Processing of Pharmaceutical Molecules A guide to the latest industry principles for optimizing the production of solid state active pharmaceutical ingredients Solid State Development and Processing of Pharmaceutical Molecules is an authoritative guide that covers the entire pharmaceutical value chain. The authors—noted experts on the topic—examine the importance of the solid state form of chemical and biological drugs and review the development, production, quality control, formulation, and stability of medicines. The book explores the most recent trends in the digitization and automation of the pharmaceutical production processes that reflect the need for consistent high quality. It also includes information on relevant regulatory and intellectual property considerations. This resource is aimed at professionals in the pharmaceutical industry and offers an in-depth examination of the commercially relevant issues facing developers, producers and distributors of drug substances. This important book: Provides a guide for the effective development of solid drug forms Compares different characterization methods for solid state APIs Offers a resource for understanding efficient production methods for solid state forms of chemical and biological drugs Includes information on automation, process control, and machine learning as an integral part of the development and production workflows Covers in detail the regulatory and quality control aspects of drug development Written for medicinal chemists, pharmaceutical industry professionals, pharma engineers, solid state chemists, chemical engineers, Solid State Development and Processing of Pharmaceutical Molecules reviews information on the solid state of active pharmaceutical ingredients for their efficient development and production.

*Handbook of Spectroscopy* Aug 01 2020 This handbook provides a straightforward introduction to spectroscopy, showing what it can do and how it does it, together with a clear, integrated and objective account of the wealth of information that can be derived from spectra. The sequence of chapters covers a wide range of the electromagnetic spectrum, and the physical processes involved, from nuclear phenomena to molecular rotation processes. - A day-by-day laboratory guide: its design based on practical knowledge of spectroscopists at universities, industries and research institutes - A well-structured information source containing methods and applications sections framed by sections on general topics - Guides users to a decision about which spectroscopic method and which instrumentation will be the most appropriate to solve their own practical problem - Rapid access to essential information - Correct analysis of a huge number of measured spectra data and smart use of such information sources as databases and spectra libraries

*Handbook of Applied Solid State Spectroscopy* Jun 23 2022 Solid-State spectroscopy is a burgeoning field with applications in many branches of science, including physics, chemistry, biosciences, surface science, and materials science. This handbook brings together in one volume information about various spectroscopic techniques that is currently scattered in the literature of these disciplines. This concise yet comprehensive volume covers theory and applications of a broad range of spectroscopies. It provides an overview of sixteen spectroscopic techniques and self-contained chapters present up-to-date scientific and technical information and references with minimal overlap and redundancy.

*Optical Properties of Solids* Nov 16 2021 For final year undergraduates and graduate students in physics, this book offers an up-to-date treatment of the optical properties of solid state materials.

*An Introduction to the Optical Spectroscopy of Inorganic Solids* Nov 04 2020 This practical guide to spectroscopy and inorganic materials meets the demand from academia and the science community for an introductory text that introduces the different optical spectroscopic techniques, used in many laboratories, for material characterisation. Treats the most basic aspects to be introduced into the field of optical spectroscopy of inorganic materials, enabling a student to interpret simple optical (absorption, reflectivity, emission and scattering) spectra Contains simple, illustrative examples and solved exercises Covers the theory, instrumentation and applications of spectroscopy for the characterisation of inorganic materials, including lasers, phosphors and optical materials such as photonics This is an ideal beginner's guide for students with some previous knowledge in quantum mechanics and optics, as well as a reference source for professionals or researchers in materials science, especially the growing field of optical materials.

*Solid-state NMR* Oct 23 2019 Nuclear Magnetic Resonance (NMR) has proved to be a uniquely powerful and versatile tool for analyzing and characterizing chemicals and materials of all kinds. This book focuses on the latest developments and applications for "solid-state" NMR, which has found new uses from archaeology to crystallography to biomaterials and pharmaceutical science research. The book will provide materials engineers, analytical chemists, and physicists, in and out of lab, a survey of the techniques and the essential tools of solid-state NMR, together with a practical guide on applications. In this concise introduction to the growing field of solid-state nuclear magnetic resonance spectroscopy the reader will find: Basic NMR concepts for solids, including guidance on the spin-1/2 nuclei concept Coverage of the quantum mechanics aspects of solid state NMR and an introduction to the concept of quadrupolar nuclei An understanding relaxation, exchange and quantitation in NMR An analysis and interpretation of NMR data, with examples from crystallography studies Appendices covering spin properties of spin-1/2 nuclides as well as NMR simulation procedures

**Advances in Biological Solid-State NMR** Sep 02 2020 Advances in Biological NMR brings the reader up to date with chapters from international leaders of this growing field, covering the most recent developments in the methodology and applications of solid state NMR to studies of membrane interactions and molecular motions.

**Solid State Theory** Nov 23 2019 DIVERThorough, modern study of solid state physics; solid types and symmetry, electron states, electronic properties and cooperative phenomena. /div

**Modulation Spectroscopy** Aug 13 2021

**Solid-State NMR in Zeolite Catalysis** Jun 11 2021 Solid-State NMR Characterization of Heterogeneous Catalysts and Catalytic Reactions provides a comprehensive account of state-of-the-art solid-state NMR techniques and the application of these techniques in heterogeneous catalysts and related catalytic reactions. It includes an introduction to the basic theory of solid-state NMR and various frequently used techniques. Special emphasis is placed on characterizing the framework and pore structure, active site, guest-host interaction, and synthesis mechanisms of heterogeneous catalysts using multinuclear one- and two-dimensional solid-state NMR spectroscopy. Additionally, various in-situ solid-state NMR techniques and their applications in investigation of the mechanism of industrially important catalytic reactions are also discussed. Both the fundamentals and the latest research results are covered, making the book suitable as a reference guide for both experienced researchers in and newcomers to this field. Feng Deng is a Professor at Wuhan Institute of Physics and Mathematics, Chinese Academy of Sciences.

*Characterisation Methods in Solid State and Materials Science* Jun 30 2020 This book presents a comprehensive overview of the various characterisation techniques involved in solid state research. The generalised approach offers a deeper understanding of the benefits, drawbacks and overlap within different characterisation techniques. In particular, the book examines techniques within diffraction, microscopy and spectroscopy and discusses thermal, electric and magnetic characterisation.