

Handbook Of Raman Spectroscopy From The Research Laboratory To The Process Line Practical Spectroscopy

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Introductory Raman Spectroscopy - John R. Ferraro 2012-12-02

Praise for Introductory Raman Spectroscopy Highlights basic theory, which is treated in an introductory fashion Presents state-of-the-art instrumentation Discusses new applications of Raman spectroscopy in industry and research

Confocal Raman Microscopy - Jan Toporski 2018-03-01

This second edition provides a cutting-edge overview of physical, technical and scientific aspects related to the widely used analytical method of confocal Raman microscopy. The book includes expanded background information and adds insights into how confocal Raman microscopy, especially 3D Raman imaging, can be integrated with other methods to produce a variety of correlative microscopy combinations. The benefits are then demonstrated and supported by numerous examples from the fields of materials science, 2D materials, the life sciences, pharmaceutical research and development, as well as the geosciences.

The Handbook of Infrared and Raman Characteristic Frequencies of Organic Molecules - Daimay Lin-Vien 1991-12-02

This necessary desk reference for every practicing spectroscopist represents the first definitive book written specifically to integrate knowledge about group frequencies in infrared as well as Raman spectra. In the spirit of previous classics developed by Bellamy and others, this volume has expanded its scope and updated its coverage. In addition to detailing characteristic group frequencies of compounds from a comprehensive assortment of categories, the book includes a collection of spectra and a literature search conducted to verify existing correlations and to determine ways to enhance correlations between vibrational frequencies and molecular structure. Particular attention has been given to the correlation between Raman characteristic frequencies and molecular structure. Key Features * Constitutes a necessary reference for every practicing vibrational spectroscopist * Provides the new definitive text on characteristic frequencies of organic molecules * Incorporates group frequencies for both infrared and Raman spectra * Details the characteristic IR and Raman frequencies of compounds in more than twenty major categories * Includes an extensive collection of spectra * Compiled by internationally recognized experts

Handbook of Spectroscopy Günter Gauglitz 2006-03-06

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

Source Book on Raman Effect: 1958- 1978 Rappal Sangameswara Krishnan 1989

Handbook of Industrial Polyethylene and Technology - Mark A.

Spalding 2017-10-12

This handbook provides an exhaustive description of polyethylene. The 50+ chapters are written by some of the most experienced and prominent authors in the field, providing a truly unique view of polyethylene. The book starts with a historical discussion on how low density polyethylene was discovered and how it provided unique opportunities in the early days. New catalysts are presented and show how they created an expansion in available products including linear low density polyethylene, high density polyethylene, copolymers, and polyethylene produced from metallocene catalysts. With these different catalysts systems a wide range of structures are possible with an equally wide range of physical properties. Numerous types of additives are presented that include additives for the protection of the resin from the environment and processing, fillers, processing aids, anti-fogging agents, pigments, and flame retardants. Common processing methods including extrusion, blown film, cast film, injection molding, and thermoforming are presented along with some of the more specialized processing techniques such as rotational molding, fiber processing, pipe extrusion, reactive extrusion, wire and cable, and foaming processes. The business of polyethylene including markets, world capacity, and future prospects are detailed. This handbook provides the most current and complete technology assessments and business practices for polyethylene resins.

Handbook of Spectroscopy - Tuan Vo-Dinh 2003-10-17

Research scientists, analytical scientists, industrial engineers, astronomers, and others who utilize the ever-increasing power of spectroscopic methods need an accessible, authoritative guidance on how best to apply current available techniques to their particular fields of interest and to their specific applications. Based on a survey of spectroscopists in universities, research, and industry, this is the first handbook to fulfill their needs. (Midwest).

Raman Spectroscopy in Cultural Heritage Preservation - Howell G. M. Edwards 2022

This book addresses the application of Raman spectroscopic techniques to a range of diverse problems which arise in the study, conservation and restoration of artefacts and sites closely related to our cultural heritage as well as in authentication. These themes are naturally wider than what at first might be considered as artworks and archaeological artefacts and the topics include pigments, paintings, ceramics, glass, sculpture and patination / corrosion, textiles, industrial archaeology, the degradation and preservation of biomaterials, mummies and human skeletal remains. An interesting feature is the inclusion of modern case studies which describe specific problems and approaches to the Raman spectral analysis of items important to our cultural heritage. The text is prefaced with an introduction to the important parameters used in nondestructive Raman measurements and also highlights some future applications based upon novel miniaturised instrumentation for in-field studies and potential screening work which will identify specimens which would repay further studies in the laboratory. An attempt is made to give a snapshot of the state-of-the-art evolution since the beginning of the technique (1970s) and to point out potential further development. The book is co-edited by three international experts with many years' experience in the application of Raman spectroscopy to artworks, archaeological artefacts and in the investigation of materials and sites for cultural heritage preservation and each editor has undertaken to write individual chapters and different topics personally. The adopted approach is designed to convey the sort of information which has become available from the

adoption of analytical Raman spectroscopy to different problems in the field of cultural heritage preservation through the spectral interrogation of artefacts and how the interpretation of the spectral data can assist museum curators, archaeologists and cultural heritage historians in the preservation and conservation of ancient materials and sites : a particular advantage in this respect is the ability of Raman spectroscopy to determine generally in a strictly noninvasive procedure - at the laboratory or on-site with mobile instruments, the presence of both organic and inorganic components in a particular specimen together nondestructively without any chemical and mechanical pretreatment being undertaken, which is an essential requirement for rare and valuable samples . An important aside from this work is the means of spectral identification of ongoing biodeterioration and biological colonisation in specimens in storage and the effects of environmental deterioration such as humidity and temperature upon their integrity.

Coherent Raman Scattering Microscopy - Ji-Xin Cheng 2016-04-19
The First Book on CRS Microscopy Compared to conventional Raman microscopy, coherent Raman scattering (CRS) allows label-free imaging of living cells and tissues at video rate by enhancing the weak Raman signal through nonlinear excitation. Edited by pioneers in the field and with contributions from a distinguished team of experts, Coherent Raman Scattering Microscopy explains how CRS can be used to obtain a point-by-point chemical map of live cells and tissues. In color throughout, the book starts by establishing the foundation of CRS microscopy. It discusses the principles of nonlinear optical spectroscopy, particularly coherent Raman spectroscopy, and presents the theories of contrast mechanisms pertinent to CRS microscopy. The text then provides important technical aspects of CRS microscopy, including microscope construction, detection schemes, and data analyses. It concludes with a survey of applications that demonstrate how CRS microscopy has become a valuable tool in biomedicine. Due to its label-free, noninvasive examinations of living cells and organisms, CRS microscopy has opened up exciting prospects in biology and medicine—from the mapping of 3D distributions of small drug molecules to identifying tumors in tissues. An in-depth exploration of the theories, technology, and applications, this book shows how CRS microscopy has impacted human health and will deepen our understanding of life processes in the future.

Infrared and Raman Spectroscopies of Clay Minerals - 2017-10-27
Infrared and Raman Spectroscopies of Clay Minerals, Volume 8 in the Developments in Clay Science series, is an up-to-date overview of spectroscopic techniques used in the study of clay minerals. The methods include infrared spectroscopy, covering near-IR (NIR), mid-IR (MIR), far-IR (FIR) and IR emission spectroscopy (IES), as well as FT-Raman spectroscopy and Raman microscopy. This book complements the succinct introductions to these methods described in the original Handbook of Clay Science (Volumes 1, 1st Edition and 5B, 2nd Edition), offering greater depth and featuring the most important literature since the development and application of these techniques in clay science. No other book covers such a wide variety of vibrational spectroscopic techniques in a single volume for clay and soil scientists. Includes a systematic review of spectroscopic methods Covers the theory of infrared and Raman spectroscopies and instrumentation Features a series of chapters each covering either a particular technique or application

Handbook of Deposition Technologies for Films and Coatings - Peter M. Martin 2009-12-01

This 3e, edited by Peter M. Martin, PNNL 2005 Inventor of the Year, is an extensive update of the many improvements in deposition technologies, mechanisms, and applications. This long-awaited revision includes updated and new chapters on atomic layer deposition, cathodic arc deposition, sculpted thin films, polymer thin films and emerging technologies. Extensive material was added throughout the book, especially in the areas concerned with plasma-assisted vapor deposition processes and metallurgical coating applications. * Explains in depth the many recent i

Infrared and Raman Spectroscopy - Bernhard Schrader 2008-09-26

This book is an excellent introduction to vibrational spectroscopy for scientists in academia and industry. Both infrared and Raman spectroscopy are covered comprehensively and up-to-date. Therefore the book may also be used as a handbook for easy reference. Written in the language of chemists, it explains the basic theory and instrumentation, the interpretation and evaluation of spectra. Furthermore numerous, worked-out examples of practical applications are presented. Therefore the reader is enabled to apply infrared and Raman spectroscopy for solving his own problem and to design suitable experimental procedures. This book also serves as a guide to the relevant literature

The Handbook of Infrared and Raman Spectra of Inorganic Compounds and Organic Salts: Infrared and Raman spectral atlas of inorganic compounds and organic salts. Raman spectra -

Richard A. Nyquist 1997

Handbook of Infrared and Raman Spectra of Inorganic Compounds and Organic Salts.

Handbook of Fourier Transform Raman and Infrared Spectra of Polymers - A.H. Kuptsov 1998-10-29

A collection of infrared and Raman spectra of 500 natural and synthetic polymers of industrial importance is presented in this book. A large variety of compounds are included, starting with linear polyolefins and finishing with complex biopolymers and related compounds. The spectra were registered using Infrared Fourier Transform Spectrometers in the laboratory of the All-Russia Institute of Forensic Sciences. The IR and Raman spectra are presented together on the same sheet. The accompanying data include general and structure formulae, CAS register numbers, and sample preparation conditions. Features of this book: • Continues the long tradition of publishing specific and standard data of new chemical compounds. • For low-molecular weight substances, complementary IR and Raman spectra are featured on the same sample and printed on the same page. This "fingerprint" data allows the substance of the sample to be identified without doubt. • An important feature of this unique collection of data is the increase in the identification precision of unknown substances. • Peak tables are available in digital (ASCII) format, on a diskette delivered with the book. This allows the user to search for unknowns. • All the spectra in the collection are base-line corrected. This book will be of interest to scientists involved in the synthesis of new polymeric materials, polymer identification, and quality control. Libraries of scientific institutes, research centers, and universities involved in vibrational spectroscopy will also find this collection invaluable.

Process Analytical Technology - Katherine A. Bakeev 2010-04-01

Process Analytical Technology explores the concepts of PAT and its application in the chemical and pharmaceutical industry from the point of view of the analytical chemist. In this new edition all of the original chapters have been updated and revised, and new chapters covering the important topics of sampling, NMR, fluorescence, and acoustic chemometrics have been added. Coverage includes: Implementation of Process Analytical Technologies UV-Visible Spectroscopy for On-line Analysis Infrared Spectroscopy for Process Analytical Applications Process Raman Spectroscopy Process NMR Spectroscopy: Technology and On-line Applications Fluorescent Sensing and Process Analytical Applications Chemometrics in Process Analytical Technology (PAT) On-Line PAT Applications of Spectroscopy in the Pharmaceutical Industry Future Trends for PAT for Increased Process Understanding and Growing Applications in Biomanufacturing NIR Chemical Imaging This volume is an important starting point for anyone wanting to implement PAT and is intended not only to assist a newcomer to the field but also to provide up-to-date information for those who practice process analytical chemistry and PAT. It is relevant for chemists, chemical and process engineers, and analytical chemists working on process development, scale-up and production in the pharmaceutical, fine and specialty chemicals industries, as well as for academic chemistry, chemical engineering, chemometrics and pharmaceutical science research groups focussing on PAT. Review from the First Edition "The book provides an excellent first port of call for anyone seeking material and discussions to understand the area better. It deserves to be found in every library that serves those who are active in the field of Process Analytical Technology."—Current Engineering Practice

Infrared and Raman Spectra of Inorganic and Coordination Compounds, Part A - Kazuo Nakamoto 2008-12-22

The Sixth Edition of this classic work comprises the most comprehensive and current guide to infrared and Raman spectra of inorganic, organometallic, bioinorganic, and coordination compounds. From fundamental theories of vibrational spectroscopy to applications in a variety of compound types, this has been extensively updated. New topics include the theoretical calculations of vibrational frequencies (DFT method), chemical synthesis by matrix co-condensation reactions, time-resolved Raman spectroscopy, and more. This volume is a core reference for chemists and medical professionals working with infrared or Raman spectroscopies and an excellent textbook for graduate courses.

Handbook of Nanocellulose and Cellulose Nanocomposites, 2 Volume Set - Hanieh Kargazadeh 2017-06-19

An up-to-date and comprehensive overview summarizing recent achievements, the state of the art, and trends in research into

nanocellulose and cellulose nanocomposites. Following an introduction, this ready references discusses the characterization as well surface modification of cellulose nanocomposites before going into details of the manufacturing and the self-assembly of such compounds. After a description of various alternatives, including thermoplastic, thermosetting, rubber, and fully green cellulose nanocomposites, the book continues with their mechanic and thermal properties, as well as crystallization and rheology behavior. A summary of spectroscopic and water sorption properties precedes a look at environmental health and safety of these nanocomposites. With its coverage of a wide variety of materials, important characterization tools and resulting applications, this is an essential reference for beginners as well as experienced researchers.

Infrared and Raman Spectroscopy Peter Larkin 2017-11-13

Infrared and Raman Spectroscopy, Principles and Spectral Interpretation, Second Edition provides a solid introduction to vibrational spectroscopy with an emphasis on developing critical interpretation skills. This book fully integrates the use of both IR and Raman spectroscopy as spectral interpretation tools, enabling the user to utilize the strength of both techniques while also recognizing their weaknesses. This second edition more than doubles the amount of interpreted IR and Raman spectra standards and spectral unknowns. The chapter on characteristic group frequencies is expanded to include increased discussions of sulphur and phosphorus organics, aromatic and heteroaromatics as well as inorganic compounds. New topics include a discussion of crystal lattice vibrations (low frequency/THz), confocal Raman microscopy, spatial resolution in IR and Raman microscopy, as well as criteria for selecting Raman excitation wavelengths. These additions accommodate the growing use of vibrational spectroscopy for process analytical monitoring, nanomaterial investigations, and structural and identity determinations to an increasing user base in both industry and academia. Integrates discussion of IR and Raman spectra Pairs generalized IR and Raman spectra of functional groups with tables and text Includes over 150 fully interpreted, high quality IR and Raman reference spectra Contains fifty-four unknown IR and Raman spectra, with a corresponding answer key

Concise Handbook Of Analytical Spectroscopy, The: Theory, Applications, And Reference Materials (In 5 Volumes) - Jerome (Jerry) James Workman, Jr 2016-06-17

The concept of improving the use of electromagnetic energy to achieve a variety of qualitative and quantitative spectroscopic measurements on solid and liquid materials has been proliferating at a rapid rate. The use of such technologies to measure chemical composition, appearance, for classification, and to achieve detailed understanding of material interactions has prompted a dramatic expansion in the use and development of spectroscopic techniques over a variety of academic and commercial fields. The Concise Handbook of Analytical Spectroscopy is integrated into 5 volumes, each covering the theory, instrumentation, sampling methods, experimental design, and data analysis techniques, as well as essential reference tables, figures, and spectra for each spectroscopic region. The detailed practical aspects of applying spectroscopic tools for many of the most exciting and current applications are covered. Featured applications include: medical, biomedical, optical, physics, common commercial analysis methods, spectroscopic quantitative and qualitative techniques, and advanced methods. This multi-volume handbook is designed specifically as a reference tool for students, commercial development and quality scientists, and researchers or technologists in a variety of measurement endeavours. Number of Illustrations and Tables: 393 b/w illus., 304 colour illus., 413 tables. Related Link(s)

Analytical Instrumentation Handbook Jack Cazes 2004-11-30

Compiled by the editor of Dekker's distinguished Chromatographic Science series, this reader-friendly reference is as a unique and stand-alone guide for anyone requiring clear instruction on the most frequently utilized analytical instrumentation techniques. More than just a catalog of commercially available instruments, the chapters are wri

Raman Spectroscopy for Nanomaterials Characterization - Challa S.S.R. Kumar 2012-03-30

First volume of a 40-volume series on nanoscience and nanotechnology, edited by the renowned scientist Challa S.S.R. Kumar. This handbook gives a comprehensive overview about Raman spectroscopy for the characterization of nanomaterials. Modern applications and state-of-the-art techniques are covered and make this volume essential reading for research scientists in academia and industry.

The Handbook of Surface Imaging and Visualization - Arthur T. Hubbard

1995-08-31

This exciting new handbook investigates the characterization of surfaces. It emphasizes experimental techniques for imaging of solid surfaces and theoretical strategies for visualization of surfaces, areas in which rapid progress is currently being made. This comprehensive, unique volume is the ideal reference for researchers needing quick access to the latest developments in the field and an excellent introduction to students who want to acquaint themselves with the behavior of electrons, atoms, molecules, and thin-films at surfaces. It's all here, under one cover! The Handbook of Surface Imaging and Visualization is filled with sixty-four of the most powerful techniques for characterization of surfaces and interfaces in the material sciences, medicine, biology, geology, chemistry, and physics. Each discussion is easy to understand, succinct, yet incredibly informative. Data illustrate present research in each area of study. A wide variety of the latest experimental and theoretical approaches are included with both practical and fundamental objectives in mind. Key references are included for the reader's convenience for locating the most recent and useful work on each topic. Readers are encouraged to contact the authors or consult the references for additional information. This is the best ready reference available today. It is a perfect source book or supplemental text on the subject.

Handbook of Enhanced Spectroscopy - Marc Lamy de la Chapelle 2015-10-16

Techniques such as Raman, infrared, fluorescence, and even nonlinear spectroscopies have recently grown in resolution and possibilities thanks to the use of nanostructured surfaces. Excitation of localized surface plasmon (LSP) and/or the use of specific shapes of nanostructures have made it possible to gain an incredible sensitivity in these spectroscopies. Unlike other books in the market, which mainly focus on surface-enhanced Raman spectroscopy (SERS) and plasmonics, the aim of this book is to provide the reader with a detailed overview of enhanced spectroscopies. It introduces plasmon and electromagnetic effects arising in metallic nanostructures, and reviews the above spectroscopies, enhanced by the presence of either a nanostructure or a tip. It reviews the theoretical basis of each technique, describes experimental procedures, and suggests some applications.

Condensed Matter Optical Spectroscopy - Iulian Ionita 2014-08-20

Discover a Modern Approach to the Study of Molecular Symmetry Classroom-tested from an author experienced in teaching a course on condensed matter spectroscopy, and introductory spectroscopy and lasers, Condensed Matter Optical Spectroscopy: An Illustrated Introduction contains over 200 color illustrations and provides a clear overview of the field.

Introductory Raman Spectroscopy - John R. Ferraro 2003-01-13

This second edition of Introductory Raman Spectroscopy serves as a guide to newcomers who wish to become acquainted with this dynamic technique. Written by three acknowledged experts this title uses examples to illustrate the usefulness of the technique of Raman spectroscopy in such diverse areas as forensic science, biochemistry, medical, pharmaceutical prescription and illicit drugs. The technique also has many uses in industry. Updated Applications chapter Demonstrated the versatility and utility of Raman spectroscopy in problem solving in science Serves as an excellent reference text for both beginners and more advanced students Discusses new applications of Raman spectroscopy in industry and research

Practical Raman Spectroscopy Peter Vandenberghe 2013-07-03

This text offers an open-learning approach to Raman spectroscopy providing detail on instrumentation, applications and discussions questions throughout the book. It provides a valuable guide to assist with teaching Raman spectroscopy which is gaining attention in (analytical) chemistry, and as a consequence, teaching programs have followed. Today, education in Raman spectroscopy is often limited to theoretical aspects (e.g. selection rules), but practical aspects are usually disregarded. With these course notes, the author hopes to fill this gap and include information about Raman instrumentation and how it is interpreted. Provides a user-friendly text that tackles the theoretical background, and offers everyday tips for common practice Raman instrumentation and practical aspects, which are sometimes overlooked, are covered Appropriate for students, and includes summaries, text boxes, illustrating the ideas with examples from research literature or providing background information or links with other courses Written with an open-learning approach, this book will be ideal for use as a self-study guide or as the basis of a taught course with discussion and self-assessment questions throughout the text Includes a comprehensive bibliography to guide the reader to more specialized texts and sources.

Handbook of Molecular Plasmonics - Fabio Della Sala 2013-08-13

While several reviews and books on surface nanophotonics and fluorescence spectroscopy are available, an updated focus on molecular plasmonics, including both theoretical methods and experimental aspects, is still lacking. This handbook is a comprehensive overview on the physics of the plasmon-emitter interaction, ranging from electromagnetism to quantum mechanics, from metal-enhanced fluorescence to surface-enhanced Raman scattering, from optical microscopy to synthesis of metal nanoparticles, filling the gap in the literature of this merging field. It allows experimentalists to have a solid theoretical reference at a different level of accuracy, and theoreticians to find new stimuli for novel computational methods and emerging applications.

Handbook of Raman Spectroscopy - Ian R. Lewis 2001-08-08

This work covers principles of Raman theory, analysis, instrumentation, and measurement, specifying up-to-the-minute benefits of Raman spectroscopy in a variety of industrial and academic fields, and how to cultivate growth in new disciplines. It contains case studies that illustrate current techniques in data extraction and analysis, as well as over 500 drawings and photographs that clarify and reinforce critical text material. The authors discuss Raman spectra of gases; Raman spectroscopy applied to crystals, applications to gemology, in vivo Raman spectroscopy, applications in forensic science, and collectivity of vibrational modes, among many other topics.

Infrared and Raman Spectroscopic Imaging - Reiner Salzer 2014-08-07

This second edition of the successful ready reference is updated and revised with approximately 30% new content to reflect the numerous instrumental developments and improvements, as well as the significant expansion of this rapidly developing field. For example, the combination of IR imaging with AFM has enhanced the achievable lateral resolution by an order of magnitude down to a few hundred nanometers, thus launching a multiplicity of new applications in material science.

Furthermore, Raman and IR spectroscopic imaging have become key technologies for the life sciences and today contribute tremendously to a better and more detailed understanding of numerous biological and medical research topics. The topical structure of this new edition is now subdivided into four parts. The first treats the fundamentals of the instrumentation for infrared and Raman imaging and mapping and an overview on the chemometric tools for image analysis. The second part describes a wide variety of applications ranging from biomedical via food, agriculture and plants to polymers and pharmaceuticals. This is followed by a description of imaging techniques operating beyond the diffraction limit, while the final part covers special methodical developments and their utility in specific fields. With its many valuable practical tips, this is a must-have overview for researchers in academic and industrial laboratories wishing to obtain reliable results with this method.

Handbook of Organic Compounds: Methods and interpretations - Jerry Workman 2001

For students and vibrational spectroscopists working in molecular spectroscopy labs and dealing daily with spectral interpretation and data processing of organic spectra, polymers, and surfactants. This three-volume compendium contains detailed descriptions and reviews of ultraviolet, visible, near-infrared, Raman, and dielectric measurement techniques, as well as interpretive techniques, and information on all spectra, which are presented in terms of wavenumber and transmittance. Ultraviolet, visible, 4th-overtone NIR, 3rd-overtone NIR, and NIR spectra are also presented in terms of nanometers and absorbance space; and horizontal ATR spectra are presented in terms of wavenumber and absorbance space. The spectra found here are useful for identification purposes as well as for instruction in the various interpretive and data-processing techniques discussed. Editor Workman is employed at Kimberly-Clark Corporation. c. Book News Inc.

Course Notes on the Interpretation of Infrared and Raman Spectra - Dana W. Mayo 2004-06-07

Interpretation of IR and Raman Spectra provides the fundamentals of interpreting IR and Raman spectra of complex molecules primarily organic molecules. Examinations of theory provide a basis for predicting functional group frequency location in new molecular structures. Generously enriched with sample exercises to help rapidly develop powerful interpretive skills. Includes appendices with fourteen bibliographies by subject area.

Modern Raman Spectroscopy - Ewen Smith 2013-03-15

This book reflects the dramatic increase in the number of Raman

spectrometers being sold to and used by non-expert practitioners. It contains coverage of Resonance Raman and SERS, two hot areas of Raman, in a form suitable for the non-expert. Builds Raman theory up in stages without overloading the reader with complex theory. Includes two chapters on instrumentation and interpretation that shows how Raman spectra can be obtained and interpreted. Explains the potential of using Raman spectroscopy in a wide variety of applications. Includes detailed, but concise information and worked examples.

Handbook of Infrared and Raman Spectra of Inorganic Compounds and Organic Salts Richard A. Nyquist 1996-08-30

Handbook of Infrared and Raman Spectra of Inorganic Compounds and Organic Salts

Handbook of Optical Biomedical Diagnostics - Valerii Viktorovich Tuchin 2016

This text begins by describing the basic principles and diagnostic applications of optical techniques based on detecting and processing the scattering, fluorescence, FT IR, and Raman spectroscopic signals from various tissues, with an emphasis on blood, epithelial tissues, and human skin. The second half of the volume discusses specific imaging technologies, such as Doppler, laser speckle, optical coherence tomography (OCT), and fluorescence and photoacoustic imaging.

Vibrational Spectroscopy Applications in Biomedical, Pharmaceutical and Food Sciences - Andrei A. Bunaciu 2020-07-26

Vibrational Spectroscopy Applications in Biomedical, Pharmaceutical and Food Sciences synthesizes the latest research on the applications of vibrational spectroscopy in biomedical, pharmaceutical and food analysis. Suitable for graduate-level students as well as experienced researchers in academia and industry, this book is organized into five distinct sections. The first deals with the fundamentals of vibrational spectroscopy, with the second presenting the most important sampling methodology used for infrared and Raman spectroscopy in various fields of interest. Since spectroscopy is the study of the interaction of electromagnetic radiation with matter, this section deals with the characteristics, properties and absorption of electromagnetic radiation. Final sections describe the analytical studies performed all over the world in biomedical, pharmaceutical and in the food sciences. Presents a critical discussion of many of the applications of vibrational spectroscopy. Covers details of the analytical methodologies used in pharmaceutical and biomedical applications. Discusses the latest developments in pharmaceutical and biomedical analysis of both small and large molecules.

Handbook of Raman Spectroscopy - Ian R. Lewis 2001-08-08

This work covers principles of Raman theory, analysis, instrumentation, and measurement, specifying up-to-the-minute benefits of Raman spectroscopy in a variety of industrial and academic fields, and how to cultivate growth in new disciplines. It contains case studies that illustrate current techniques in data extraction and analysis, as well as over 500 drawings and photographs that clarify and reinforce critical text material. The authors discuss Raman spectra of gases; Raman spectroscopy applied to crystals, applications to gemology, in vivo Raman spectroscopy, applications in forensic science, and collectivity of vibrational modes, among many other topics.

Modern Raman Microscopy - Alexander Rzhevskii 2021-06-02

Raman microscopy is now well-established as one of the most powerful and versatile techniques for a diverse range of applications in both research and analytical laboratories. Its unique advantage is its ability to noninvasively characterize chemically complex and spatially inhomogeneous samples with a sub-micron spatial resolution. Modern confocal Raman scanning microscopy, which allows one to obtain two- and three-dimensional spectrochemical images of samples in various states and forms, has become a method of choice for a wide range of applications including the study of biological cells, tissues, and microorganisms, characterization of pharmaceutical drugs and formulations, forensic evidence, minerals and gems, carbon nanomaterials, semiconductors, composite polymers, and more. This book presents the techniques of confocal Raman microscopy and imaging for researchers and engineers from a variety of disciplines. It highlights the key aspects of this technique in order to effectively apply it in practice. It will appeal to a wide circle of readers who are interested in, or are already, using the methods of confocal Raman microscopy and imaging in their work, and will also be beneficial for novice Raman microscopy users.

Ewing's Analytical Instrumentation Handbook, Fourth Edition - Nelu Grinberg 2019-02-21

This handbook is a guide for workers in analytical chemistry who need a

starting place for information about a specific instrumental technique. It gives a basic introduction to the techniques and provides leading references on the theory and methodology for an instrumental technique. This edition thoroughly expands and updates the chapters to include concepts, applications, and key references from recent literature. It also contains a new chapter on process analytical technology.

Infrared and Raman Spectroscopy in Forensic Science - John M. Chalmers 2012-03-05

This book will provide a survey of the major areas in which information derived from vibrational spectroscopy investigations and studies have contributed to the benefit of forensic science, either in a complementary or a unique way. This is highlighted by examples taken from real case

studies and analyses of forensic relevance, which provide a focus for current and future applications and developments.

Vibrational (Infrared and Raman) Spectra of Minerals and Related Compounds - Nikita V. Chukanov 2019-11-28

The book presents new data on the IR spectra of minerals and on the Raman spectra of more than 2000 mineral species. It also includes examples of IR spectroscopy applications to investigate minerals, and discusses the most important potential applications of Raman spectroscopy in mineralogical research. The book serves as a reference resource and a methodological guide for mineralogists, petrologists and technologists working in the field of inorganic materials.