
Emerging Raman Applications And Techniques In Biomedical And Pharmaceutical Fields Biological And Medical Physics Biomedical Engineering

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 Basics, Instrumentation, and Applications
 Proceedings of the NATO ARW on Frontiers in Spectroscopy of Emergent Materials: Recent Advances toward New Technologies, Sudak, Crimea, Ukraine, from 14 to 18 September 2003.
 Emerging Nanotechnologies in Dentistry
 Methods in Physical Chemistry, 2 Volume Set
 Processes, Materials and Applications
 A Multidisciplinary Approach

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TRUJILLO ALANA

Advances and Applications: Volume 2 Royal Society of Chemistry
 In the last decade, we have seen spurring growth in academic and industrial interest in Raman spectroscopy and its modifications, in particular, Surface-Enhanced Raman Spectroscopy (SERS). This is evident by the number of SERS publications in the last decade, from 580 in 2005 to almost 2000 in 2014. There are now companies worldwide that are dedicated to manufacturing SERS substrate, sensors, and other SERS-based products. The miniaturization of Raman instrumentation from

bulky and expensive bench-top designs to inexpensive handheld spectrometers has allowed SERS to be employed as an in situ detection technique. Some examples of the industrial success of Raman and SERS are rapid raw material identification (RMID), Process Analytical Technology (PAT) and drug screening in pharma and biotech industries, continuous surveillance of food, water, and environmental safety, and the diagnosis and continuous monitoring of diseases like cancer, diabetes, etc. This progress in translating Raman and SERS techniques into commercial use and commercial products is possible because of the close collaboration between scientists and engineers. However, the weak signals of Raman spectroscopy is an inherent limitation of the spontaneous Raman spectroscopy technique. Therefore, several modifications have been made, including but not limited to, surface-enhanced Raman spectroscopy (SERS),

spatially offset Raman spectroscopy (SORS), transmission Raman spectroscopy (TRS), coherent anti-Stokes Raman spectroscopy (CARS), and tip-enhanced Raman spectroscopy (TERS).

Spontaneous Raman spectroscopy has become a one-of-a kind, portable, and affordable technology for in-situ detection and continuous monitoring in resource-limited-settings. The primary focus of this textbook is to try to cover the fundamentals in SERS methods of preparing substrates and sensors, and efficient spectral analysis approaches like chemometrics for diverse applications, listed in the paragraph above. However, with a goal to give a true picture to the audience when assessing the scope of spontaneous Raman and Surface-enhanced Raman for specific applications, we have briefly introduced industrially successful examples of other types of Raman spectroscopy techniques, such as SORS, TRS, and CARS.

Surface-enhanced Raman Spectroscopy Elsevier

This handbook gives a comprehensive overview about Raman spectroscopy for the characterization of nanomaterials. It is the first volume of a 40-volume series on nanoscience and nanotechnology, edited by the renowned scientist Challa S.S.R. Kumar.

Comprehensive Chemometrics Springer Science & Business Media

Malaria is one of the most important tropical diseases in the history of the world. This vector-borne disease has been a significant cause of morbidity and mortality in tropical countries of Africa, Asia, and Latin America. As such, this book provides updated information on epidemiological and public health research of malaria conducted in the last decade. Over four sections, chapters discuss such topics as diagnosis, epidemiology and surveillance, policy and prevention, and vector control and vaccines.

Instrumentation and Applications Woodhead Publishing

Contributed articles presented at the Meghnad Saha Memorial Symposium on Emerging Trends in Laser and Spectroscopy and Applications during 23-25 March 2009 moderated by University of Allahabad, Physics Department.

Advanced Materials for Joint Implants CRC Press

Computer Vision Technology for Food Quality Evaluation, Second Edition continues to be a valuable resource to engineers, researchers, and technologists in research and development, as well as a complete reference to students interested in this rapidly expanding field. This new edition highlights the most recent developments in imaging processing and analysis techniques and methodology, captures cutting-edge developments in computer vision technology, and pinpoints future trends in research and development for food quality and safety evaluation and control. It is a unique reference that provides a deep understanding of the issues of data acquisition and image analysis and offers techniques to solve problems and further develop efficient methods for food quality assessment. Thoroughly explains what computer vision technology is, what it can do, and how to apply it for food quality evaluation. Includes a wide variety of computer vision techniques and applications to evaluate a wide variety of foods. Describes the pros and cons of different techniques for quality evaluation.

Data Mining for Biomarker Discovery Elsevier

Outlines the basic principles, advanced instrumentation, applications and future potential of a range of spectral techniques in food analysis. The book introduces new applications of GC-MS, LC-MS, MALDI TOF-MS, GC-FTIR, SFC-FTIR, ATR, and Raman spectroscopy. The book covers the identification and quantitation of food constituents, additives and contaminants.

Emerging Technologies with High Impact for Ocean Sciences, Ecosystem Management, and Environmental

Conservation Springer Nature

This book is based on recent trends for the research in emerging environmental contaminants in different compartment of the environment. It provides a recent understanding for the fate, transport, and degradation of emerging contaminants in different environmental sectors, including water, air, and soil. The contents discuss the fate and transport of microplastics, PPCPs, along with the method of detection and degradation. It includes removal of variety of pollutants including microplastics, pharmaceuticals, and personal care products from the water using adsorption technique, electrooxidation, membrane technology and other advance oxidation methods. This volume will be of great value to those in academia and industry involved in environmental science and engineering research.

New Trends in Emerging Environmental Contaminants

Springer Nature

Thanks to the progress made in instruments and techniques, the methods in physical chemistry have developed rapidly over the past few decades, making them increasingly valuable for scientists of many disciplines. These two must-have volumes meet the needs of the scientific community for a thorough overview of all the important methods currently used. As such, this work bridges the gap between standard textbooks and review articles, covering a large number of methods, as well as the motivation behind their use. A uniform approach is adopted throughout both volumes, while the critical comparison of the advantages and disadvantages of each method makes this a valuable reference for physical chemists and other scientists working with these techniques.

Forensic Science William Andrew

Concentrating on the natural science aspects of forensics, top international authors from renowned universities, institutes, and laboratories impart the latest information from the field. In doing so they provide the background needed to understand the state of the art in forensic science with a focus on biological, chemical, biochemical, and physical methods. The broad subject coverage includes spectroscopic analysis techniques in various wavelength regimes, gas chromatography, mass spectrometry, electrochemical detection approaches, and imaging techniques, as well as advanced biochemical, DNA-based identification methods. The result is a unique collection of hard-to-get data that is otherwise only found scattered throughout the literature.

Emerging Drugs in Sport CRC Press

The book highlights recent developments in the field of spectroscopy by providing the readers with an updated and high-level of overview. The focus of this book is on the introduction to concepts of modern spectroscopic techniques, recent technological innovations in this field, and current examples of applications to molecules and materials relevant for academia and industry. The book will be beneficial to researchers from various branches of science and technology, and is intended to point them to modern techniques, which might be useful for their specific problems. Spectroscopic techniques, that are discussed include, UV-Visible absorption spectroscopy, XPS, Raman spectroscopy, SERS, TERS, CARS, IR absorption spectroscopy, SFG, LIBS, Quantum cascade laser (QCL) spectroscopy, fluorescence spectroscopy, ellipsometry, cavity-enhanced absorption spectroscopy, such as cavity ring-down spectroscopy (CRDS) and evanescent wave-CRDS both in gas and condensed phases, time-resolved spectroscopy etc. Applications introduced in the different chapters demonstrates the usefulness of the spectroscopic techniques for the characterization of fundamental properties of molecules, e.g. in connection with environmental impact, bio-activity, or usefulness for pharmaceutical drugs, and materials important e.g. for nano-science, nuclear chemistry, or

bio-applications. The book presents how spectroscopic techniques can help to better understand substances, which have also great impact on questions of social and economic relevance (environment, alternative energy, etc.).

Optical Microscopic and Spectroscopic Techniques Targeting Biological Applications Elsevier

Enzymes and Coenzymes—Advances in Research and Application: 2012 Edition is a ScholarlyEditions™ eBook that delivers timely, authoritative, and comprehensive information about Enzymes and Coenzymes. The editors have built Enzymes and Coenzymes—Advances in Research and Application: 2012 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Enzymes and Coenzymes in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Enzymes and Coenzymes—Advances in Research and Application: 2012 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at <http://www.ScholarlyEditions.com/>.

Emerging Imaging Technologies in Medicine CRC Press

Raman spectroscopy has a number of applications in various fields including material science, physics, chemistry, biology, geology, and medicine. This book illustrates necessary insight and guidance in the field of Raman spectroscopy with detailed figures and explanations. This presents deep understanding of new techniques from basic introduction to the advance level for scientists and engineers. The chapters cover all major aspects of Raman spectroscopy and its application in material characterization with special emphasis on both the theoretical and experimental aspects. This book is aimed to provide solid foundation of Raman spectroscopy to the students, scientists, and engineers working in various fields as mentioned above.

Imaging Technologies and Transdermal Delivery in Skin Disorders William Andrew

Biomarker discovery is an important area of biomedical research that may lead to significant breakthroughs in disease analysis and targeted therapy. Biomarkers are biological entities whose alterations are measurable and are characteristic of a particular biological condition. Discovering, managing, and interpreting knowledge of new biomarkers are challenging and attractive problems in the emerging field of biomedical informatics. This volume is a collection of state-of-the-art research into the application of data mining to the discovery and analysis of new biomarkers. Presenting new results, models and algorithms, the included contributions focus on biomarker data integration, information retrieval methods, and statistical machine learning techniques. This volume is intended for students, and researchers in bioinformatics, proteomics, and genomics, as well engineers and applied scientists interested in the interdisciplinary application of data mining techniques.

Enzymes and Coenzymes—Advances in Research and Application: 2012 Edition Academic Press

Comprehensive Chemometrics, Second Edition features expanded and updated coverage, along with new content that covers advances in the field since the previous edition published in 2009. Subject of note include updates in the fields of multidimensional and megavariate data analysis, omics data analysis, big chemical and biochemical data analysis, data fusion and sparse methods. The book follows a similar structure to the previous edition, using the same section titles to frame articles.

Many chapters from the previous edition are updated, but there are also many new chapters on the latest developments. Presents integrated reviews of each chemical and biological method, examining their merits and limitations through practical examples and extensive visuals Bridges a gap in knowledge, covering developments in the field since the first edition published in 2009 Meticulously organized, with articles split into 4 sections and 12 sub-sections on key topics to allow students, researchers and professionals to find relevant information quickly and easily Written by academics and practitioners from various fields and regions to ensure that the knowledge within is easily understood and applicable to a large audience Presents integrated reviews of each chemical and biological method, examining their merits and limitations through practical examples and extensive visuals Bridges a gap in knowledge, covering developments in the field since the first edition published in 2009 Meticulously organized, with articles split into 4 sections and 12 sub-sections on key topics to allow students, researchers and professionals to find relevant information quickly and easily Written by academics and practitioners from various fields and regions to ensure that the knowledge within is easily understood and applicable to a large audience

Spectral Methods in Food Analysis Bentham Science Publishers

Based on an interdisciplinary approach that directly bridges orthopedic concepts to surface science, this book details cutting-edge research in bioceramics science, physical chemistry, biomedical optics, and nanomechanics. The book cites some of the more conventional spectroscopic characterization techniques—including Raman and cathodoluminescence spectroscopy. These techniques have been used to unveil molecular scale phenomena of both chemical and mechanical origin occurring at the sliding surfaces of bioceramic joints. These concepts are of critical importance to researchers as they are relevant to the development of new biomaterials.

Modern Techniques of Spectroscopy Emerging Raman

Applications and Techniques in Biomedical and Pharmaceutical Fields

This book presents the latest technological advances in Raman spectroscopy that are presently redrawing the landscape of many fields of biomedical and pharmaceutical R&D. Numerous examples are given to illustrate the application of the new methods.

Emerging Trends in Laser & Spectroscopy and Applications John Wiley & Sons

New nanomaterials are leading to a range of emerging dental treatments that utilize more biomimetic materials that more closely duplicate natural tooth structure (or bone, in the case of implants). The use of nanostructures that will work in harmony with the body's own regenerative processes (eg, to restore tooth structure or alveolar bone) are moving into clinical practice. This book brings together an international team of experts from the fields of nanomaterials, biomedical engineering and dentistry, to cover the new materials and techniques with potential for use intra-orally or extra-orally for the restoration, fixation, replacement, or regeneration of hard and soft tissues in and about the oral cavity and craniofacial region. New dental nanotechnologies include the use of advanced inorganic and organic materials, smart and biomimetic materials, tissue engineering and drug delivery strategies. Book prepared by an interdisciplinary and international group of bio-nanomaterial scientists and dental/oral biomedical researchers Comprehensive professional reference for the subject covering materials fabrication and use of materials for all major diagnostic and therapeutic dental applications - repair, restoration, regeneration, implants and prevention Book focuses in depth on the materials

manufacturing processes involved with emphasis on pre-clinical and clinical applications, use and biocompatibility

Bio-Materials and Prototyping Applications in Medicine

BoD - Books on Demand

From the discovery of x-rays in 1895 through the emergence of computed tomography (CT) in the 1970s and magnetic resonance imaging (MRI) in the 1980s, non-invasive imaging has revolutionized the practice of medicine. While these technologies have thoroughly penetrated clinical practice, scientists continue to develop novel approaches that promise to push imaging into entirely new clinical realms, while addressing the issues of dose, sensitivity, or specificity that limit existing imaging approaches. *Emerging Imaging Technologies in Medicine* surveys a number of emerging technologies that have the promise to find routine clinical use in the near- (less than five years), mid- (five to ten years) and long-term (more than ten years) time frames. Each chapter provides a detailed discussion of the associated physics and technology, and addresses improvements in terms of dose, sensitivity, and specificity, which are limitations of current imaging approaches. In particular, the book focuses on modalities with clinical potential rather than those likely to have an impact mainly in preclinical animal imaging. The last ten years have been a period of fervent creativity and progress in imaging technology, with improvements in computational power, nanofabrication, and laser and detector technology leading to major new developments in phase-contrast imaging, photoacoustic imaging, and optical imaging.

Technological Innovation for Applied AI Systems Frontiers Media SA

This second, thoroughly revised, updated and enlarged edition 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 may be derived from spectra. It also features new chapters

on spectroscopy in nano-dimensions, nano-optics, and polymer analysis. Clearly structured into sixteen sections, it covers everything from spectroscopy in nanodimensions to medicinal applications, spanning a wide range of the electromagnetic spectrum and the physical processes involved, from nuclear phenomena to molecular rotation processes. In addition, data tables provide a comparison of different methods in a standardized form, allowing readers to save valuable time in the decision process by avoiding wrong turns, and also help in selecting the instrumentation and performing the experiments. These four volumes are a must-have companion for daily use in every lab.

Molecular and Laser Spectroscopy Frontiers Media SA

Principles and Clinical Diagnostic Applications of Surface-Enhanced Raman Spectroscopy summarizes the principles of surface-enhanced Raman scattering/spectroscopy (SERS) and plasmonic nanomaterials for SERS, with a focus on SERS applications in clinical diagnostics. This book covers the key concepts from the fundamentals, materials, experimental aspects, and applications of SERS in clinical diagnostics with discussions on label-free/direct SERS assay, design and synthesis of SERS nanotags, SERS nanotags for point-of-care diagnostics, microfluidic SERS assay, and in vitro and in vivo sensing and imaging. Written by experts from around the world, this comprehensive volume showcases the recent progress of SERS applications in clinical diagnostics and helps readers understand when and how to use SERS in a clinical setting. Introduces the basics of SERS and suitable nanomaterials for SERS application Gives an overview of the cutting-edge research on SERS applications for clinical diagnosis, including the latest advances in our understanding of underlying principles to enable material design and clinical applications Gradually builds from the fundamental concepts to the applications of SERS for clinical diagnostics

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