New Trends In Fluorescence Spectroscopy Applications To Chemical And Life Sciences Springer Series On Fluorescence

ALBERT KELLEY

A Tribute to Gregorio Weber New Trends in Fluorescence SpectroscopyApplications to Chemical and Life Sciences
Biological membranes play a central role in cell structure, shape and functions. However, investigating the membrane bilayer has proved to be difficult due to its highly dynamic and anisotropic structure, which generates steep gradients at the nanometer scale. Due to the decisive impact of recently developed fluorescence-based techniques, tremendous advances have been made in the last few years in our understanding of membrane characteristics and functions. In this context, the present book illustrates some of these major advances by collecting review articles written by highly respected experts. The book is organized in three parts, the first of which deals with membrane probes and model membranes. The second part describes the use of advanced quantitative and high-resolution techniques to explore the properties of biological membranes, illustrating the key progress made regarding membrane organization, dynamics and interactions. The third part is focused on the investigation of membrane proteins using the same techniques, and notably on the membrane receptors that play a central role in signaling pathways and therapeutic strategies. All chapters provide comprehensive information on membranes and their exploration for beginners in the field and advanced researchers alike.

Biophotonics: Spectroscopy, Imaging, Sensing, and Manipulation Springer Science & Business Media
Time-resolved fluorescence spectroscopy is widely used as a research tool in bioch- istry and biophysics. These uses of fluorescence have resulted in extensive knowledge of the structure and dynamics of biological macromolecules. This information has been gained by studies of phenomena that affect the excited state, such as the local environment, quenching processes, and energy transfer. Topics in Fluorescence Spectroscopy, Volume 4: Probe Design and Chemical Sensing reflects a new trend, which is the use of time-resolved fluorescence in analytical and clinical chemistry. These emerging applications of time-resolved fluorescence are the result of continued advances in laser detector and computer technology. For instance, pho- multiplier tubes (PMT) were previously bulky devices. Miniature PMTs are now available, and the performance of simpler detectors is continually improving. There is also considerable effort to develop fluorophores that can be excited with the red/ne- infrared (NIR) output of laser diodes. Using such probes, one can readily imagine small time-resolved fluorometers, even hand-held devices, being used fordoctor’s office or home health care.
The Analysis of Nuclear Materials and Their Environments Springer Science & Business Media
This volume serves as a comprehensive collection of current trends and emerging hot topics in the field of fluorescence spectroscopy. It summarizes the year’s progress in fluorescence and its applications as well as includes authoritative analytical reviews.
Standardization and Quality Assurance in Fluorescence Measurements I CRC Press
"This book is a view of enzyme catalysis by a physico-chemist with long-term experience in the investigation of structure and action mechanism of

biological catalysts. This book is not intended to provide an exhaustive survey of each topic but rather a discussion of their theoretical and experimental background, and recent developments. The literature of enzyme catalysis is so vast and many scientists have made important contribution in the area, that it is impossible in the space allowed for this book to give a representative set of references. The author has tried to use reviews, and general principles of articles. He apologizes to those he has not been able to include. . ... The monograph is intended for scientists working on enzyme catalysis and adjacent areas such as chemical modeling of biological processes, homogeneous catalysis, biomedical research and biotechnology. The book can be use as a subsidiary manual for instructors, graduate and undergraduate students of university biochemistry and chemistry departments."--Pages ix-x.

X-Ray Fluorescence Spectrometry BoD – Books on Demand

This book gathers 12 outstanding contributions that reflect state-of-the-art industrial applications of fluorescence, ranging from the pharmaceutical and cosmetics industries to explosives detection, aeronautics, instrumentation development, lighting, photovoltaics, water treatment and much more. In the field of fluorescence, the translation of research into important applications has expanded significantly over the past few decades. The 18th volume in the Springer Series on Fluorescence fills an important gap by focusing on selected industrial applications of fluorescence, described in contributions by both industry-based researchers and academics engaged in collaborations with industrial partners.

Fluorescent Methods to Study Biological Membranes John Wiley & Sons

This fourth volume in the Springer series summarizes the year’s progress in fluorescence, with authoritative analytical reviews specialized enough for professional researchers, yet also appealing to a wider audience of scientists in related fields.

Introduction to Fluorescence Spectroscopy Springer Science & Business Media

A unique book on a growing branch of chemical science which highlights the connection between information technology (engineering and biological) and chemistry.

Biophotonics Springer

Fluorescent proteins are intimately connected to research in the life sciences. Tagging of gene products with fluorescent proteins has revolutionized all areas of biosciences, ranging from fundamental biochemistry to clinical oncology, to environmental research. The discovery of the Green Fluorescent Protein, its first, seminal application and the ingenious development of a broad palette of fluorescence proteins of other colours, was consequently recognised with the Nobel Prize for Chemistry in 2008. Fluorescent Proteins II highlights the physicochemical and biophysical aspects of fluorescent protein technology beyond imaging. It is tailored to meet the needs of physicists, chemists and biologists who are interested in the fundamental properties of fluorescent proteins, while also focussing on specific applications. The implementations described are cutting-edge studies and exemplify how the physical and chemical properties of fluorescent proteins can stimulate novel findings in life sciences.

Introduction to Fluorescence Springer Science & Business Media

The Journal of Fluorescence’s fourth Who’s Who directory is to publish the names, contact details, specialty keywords, and a brief description of scientists employing fluorescence methodology and instrumentation in their working lives. In addition, the directory will provide company contact details with a brief list of fluorescence-related products. The directory will be edited by Chris D. Geddes and Joseph R. Lakowicz, editor and founding editor of the Journal of Fluorescence.

New Trends in Fluorescence Spectroscopy Springer Science & Business Media

X-ray fluorescence spectroscopy, one of the most powerful and flexible techniques available for the analysis and characterization of materials today, has gone through major changes during the past decade. Fully revised and expanded by 30%, X-Ray Fluorescence Spectrometry, Second Edition incorporates the latest industrial and scientific trends in all areas. It updates all previous material and adds new chapters on such topics as the history of X-ray fluorescence spectroscopy, the design of X-ray spectrometers, state-of-the-art applications, and X-ray spectra. Ron Jenkins draws on his extensive experience in training and consulting industry professionals for this clear and concise treatment, covering first the basic aspects of X rays, then the methodology of X-ray fluorescence spectroscopy and available instrumentation. He offers a comparison between wavelength and energy dispersive spectrometers as well as step-by-step guidelines to X-ray spectrometric techniques for qualitative and quantitative analysis-from specimen preparation to real-world industrial application. Favored by the American Chemical Society and the International Centre for Diffraction Data, X-Ray Fluorescence Spectrometry, Second Edition is an ideal introduction for newcomers to the field and an invaluable reference for experienced spectroscopists-in chemical analysis, geology, metallurgy, and materials science. An up-to-date review of X-ray spectroscopic techniques. This proven guidebook for industry professionals is thoroughly updated and expanded to reflect advances in X-ray analysis over the last decade. X-Ray Fluorescence Spectrometry, Second Edition includes: * The history of X-ray fluorescence spectrometry-new to this edition. * A critical review of the most useful X-ray spectrometers. * Techniques and procedures for quantitative and qualitative analysis. * Modern applications and industrial trends. * X-ray spectra-new to this edition.

Applications to Chemical and Life Sciences Elsevier

This volume focuses on Time-Correlated Single Photon Counting (TCSPC), a powerful tool allowing luminescence lifetime measurements to be made with high temporal resolution, even on single molecules. Combining spectrum and lifetime provides a “fingerprint” for identifying such molecules in the presence of a background. Used together with confocal detection, this permits single-molecule spectroscopy and microscopy in addition to ensemble measurements, opening up an enormous range of hot life science applications such as fluorescence lifetime imaging (FLIM) and measurement of Förster Resonant Energy Transfer (FRET) for the investigation of protein folding and interaction. Several technology-related chapters present both the basics and current state-of-the-art, in particular of TCSPC electronics, photon detectors and lasers. The remaining chapters cover a broad range of applications and methodologies for experiments and data analysis, including the life sciences, defect centers in diamonds, super-resolution microscopy, and optical tomography. The chapters detailing new options arising from the combination of classic TCSPC and fluorescence lifetime with methods based on intensity fluctuation represent a particularly unique highlight.

Applications, Methods, Instrumentation Springer Science & Business Media

This first volume in the new Springer Series on Fluorescence brings together fundamental and applied research from this highly interdisciplinary and field, ranging from chemistry and physics to biology and medicine. Special attention is given to supramolecular systems, sensor applications, confocal microscopy and protein-protein interactions. This carefully edited collection of articles is an invaluable tool for practitioners and novices.

Optical Spectroscopy: Fundamentals And Advanced Applications Springer Science & Business Media

This interdisciplinary book gives a comprehensive survey of the state-of-the-art: from applications and trends in fluorescence techniques in science to medicine and engineering. Written for practitioners and researchers in industry and academia, it covers fields like environmental and materials science, biology, medicine, physics and chemistry. Moreover, it reports on such new and breathtaking methods as ultra-fast time-resolved or single molecule spectroscopy, gives examples of applications in the fields of electroluminescent polymers, visualization of membrane potentials in neurons and fluorescence imaging of the brain.

New Trends in Fluorescence Spectroscopy Springer Science & Business Media

This volume describes an impressive array of the current photonic-related technologies being used in the investigation of biological systems. The topics include various types of microscopy (fluorescence correlation microscopy, two-photon microscopy), sensitive detection of biological molecules, nano-surgery techniques, fluorescence resonance energy transfer, nano-plasmonics, terahertz spectroscopy, and photosynthetic energy conversion. The emphasis is on the physical principles behind each technique, and on examining the advantages and limitations of each.The book begins with an overview by Paras Prasad, a leader in the field of biophotonics, of several important optical techniques currently used for studying biological systems. In the subsequent chapters these techniques are discussed in depth, providing the reader with a detailed understanding of the basic physical principles at work. An excellent treatment of terahertz spectroscopy demonstrates how photonics is being extended beyond the visible region. Recent results in the use of femtosecond lasers as a tool to porate cell walls demonstrate that the manipulation of light can be used as a tool for the study and the treatment of biological systems. The field of Bio-photonics is broad and still growing, so cannot be covered comprehensively in one volume. But here the reader will find an introduction to some of the major tools used for studying biological systems, and at the same time a detailed, first-principles treatment of the physics behind these tools.

New Trends in Fluorescence Spectroscopy Royal Society of Chemistry

`In the second edition of Principles I have attempted to maintain the emphasis on basics, while updating the examples to include more recent results from the literature. There is a new chapter providing an overview of extrinisic fluorophores. The discussion of timeresolved measurements has been expanded to two chapters. Quenching has also been expanded in two chapters. Energy transfer and anisotropy have each been expanded to three chapters. There is also a new chapter on fluorescence sensing. To enhance the usefulness of this book as a textbook, most chapters are followed by a set of problems. Sections which describe advanced topics are indicated as such, to allow these sections to be skipped in an introduction course. Glossaries are provided for commonly used acronyms and mathematical symbols. For those wanting additional informtion, the final appendix contains a list of recommended books which expand on various specialized topics.' from the author's Preface

Fluorescence Studies of Polymer Containing Systems Springer Science & Business Media

Keeping abreast of the latest techniques and applications, this new edition of the standard reference and graduate text on laser spectroscopy has been completely revised and expanded. While the general concept is unchanged, the new edition features a broad array of new material. This new edition has been completely revised, especially the chapters on non linear spectroscopy, ion trapping, ultra short laser pulses and new developments. Fifty new figures illustrate the newest developments and results. The author is one of the most renowned experts in this area and no other book with this broad scope is available.

Who's Who in Fluorescence 2008 Springer Science & Business Media

The phenomenon known as fluorescence is now widely used in the chemical and life sciences largely due to the development of highly sophisticated fluorescent probe chemistries and the commercial availability of these probes as well as the development of novel microscopy approaches. Introduction to Fluorescence helps readers acquire a sound understanding of basic fluorescence theory and practice. It describes general principles in a straightforward way and uses examples from a variety of disciplines to demonstrate them. In color throughout, the book takes readers through the history of important discoveries to the most current advances. It introduces the fundamentals of the fluorescence phenomenon and gives detailed examples of fluorescence applications in the molecular life sciences, including biochemistry, biophysics, clinical chemistry and diagnostics, pharmaceutical science, and cell and molecular biology. The author presents the basic theories underlying the applications and offers in-depth information on practical aspects. Along with a list of references in each chapter, the text incorporates more than 250 figures that clearly illustrate the concepts and gives the chemical structures of the most widely used fluorescent molecules. In addition, the appendix provides a "Rogue’s Gallery" of the most common errors and pitfalls to avoid.

Reviews in Fluorescence 2008 Springer

Chlorophyll a Fluorescence: A Signature of Photosynthesis highlights chlorophyll (Chl) a fluorescence as a convenient, non-invasive, highly sensitive, rapid and quantitative probe of oxygenic photosynthesis. Thirty-one chapters, authored by 58 international experts, provide a solid foundation of the basic theory, as well as of the application of the rich information contained in the Chl a fluorescence signal as it relates to photosynthesis and plant productivity. Although the primary photochemical reactions of photosynthesis are highly efficient, a small fraction of absorbed photons escapes as Chl fluorescence, and this fraction varies with metabolic state, providing a basis for monitoring quantitatively various processes of photosynthesis. The book explains the mechanisms with which plants defend themselves against environmental stresses (excessive light, extreme temperatures, drought, hyper-osmolarity, heavy metals and UV). It also includes discussion on fluorescence imaging of leaves and cells and the remote sensing of Chl fluorescence from terrestrial, airborne, and satellite bases. The book is intended for use by graduate students, beginning researchers and advanced undergraduates in the areas of integrative plant biology, cellular and molecular biology, plant biology, biochemistry, biophysics, plant physiology, global ecology and agriculture.

Techniques Springer Science & Business Media

This volume describes the application of fluorescence spectroscopy in polymer research. The first chapters outline the basic principles of the conformational and dynamic behavior of polymers and review the problems of polymer self-assembly. Subsequent chapters introduce the theoretical principles of advanced fluorescence methods and typical examples of their application in polymer science. The book closes with several reviews of various fluorescence applications for studying specific aspects of polymer-solution behavior. It is a useful resource for polymer scientists and experts in fluorescence spectroscopy alike, facilitating their communication and cooperation.

Molecular Logic-based Computation Springer

th The Who's Who in Fluorescence 2009 is the 7 volume of the Who's who series. The previous six volumes (2003 – 2008) have been very well received by the fluorescence community, with 1000's of copies being distributed around the world, through conferences and workshops, as well as through internet book sites. In addition, the Institute of Fluorescence (http://theinstituteoffluorescence.com/) mailed 100's of copies of the 2008 volume to contributors around the world. This new 2009 volume features some 419 entries from no fewer than 41 countries worldwide, as compared to 418 entries (38 different countries) in 2008 and 405 entries in the 2007 volume, respectively. We have received 29 new entries this year, and deleted 25 entries that were not updated by contributors from past years. In 2008, 129 AIM numbers were submitted as compared to 106 in 2007. This year the number has risen again to 136 AIM numbers submitted. This year we also see the introduction of the h-index number listing, a publication statistic provided by the Thompson's ISI Web of Science. Some 42 contributors provided their h-numbers. In 2009 we also see a continued and strong company support, in light of the current world economic climate, which will enable us to further disseminate the volume in 2009– 2010. In this regard we especially thank the instrumentation companies for their continued support, where without their financial contributions, it is likely that the volume would not be the success it is today.