Hard X-ray Photoelectron Spectroscopy (HAXPES)Handbook of Monochromatic XPS SpectraToF-SIMS Nanomaterials for Green EnergyAmorphous Solids Dispersion Advanced Gate Stacks for High-Mobility SemiconductorsElectronic Properties of Carbon NanotubesQuantitative Core Level Photoelectron SpectroscopyHumus ChemistryCasaXPS Manual 2.3.15High Temperature Gas-Solid Reactions in Earth and Planetary ProcessesElectronic SpectroscopyAnalytical PyrolysisHigh Resolution XPS of Organic PolymersRadiochemistry and Nuclear ChemistryPeak Fitting with CasaXPSMolecular Nanomaterial Synthesis to Surface Analytical NanomaterialsIntroduction to SurfaceScienceFluorinated IonomersReactions at Solid StateSurface Errors in CasaCore Level Spectroscopy of SolidsAtomic Layer Deposition Applications13Amorphous Chalcogenide Semiconductors and Related MaterialsCarbon NanotubesThe Casa CookbookQuantitative Core Level Photoelectron SpectroscopyESCA Applied to Free MoleculesCasaXPS ManualSurface Analysis by Auger and X-ray Photoelectron SpectroscopyPractical Surface Analysis, Auger and X-ray Photoelectron SpectroscopyShapes That GoCasaXPS Manual 2.3.15Encyclopedia of Analytical ChemistryThin Film Sensor Applications: Definitive Handbook of High Resolution XPS Spectra of Over One Hundred Organic Polymers. Provides the full spectral information—survey and core regions (with fitted components), shake-up spectra, valence band and, in some cases, Auger spectra. All the data are parameterized and tabulated. Complete details of sample preparation are given. Instrument performance and operating conditions are extensively documented. Complete with introductory section and comprehensive appendices. Easy-to-use landscape format.Photoemission (also known as photoelectron) spectroscopy refers to the process in which an electron is removed from a specimen after the atomic absorption of a photon. The first evidence of this phenomenon dates back to 1887 but it was not until 1905 that Einstein offered an explanation of this effect, known as photoelectron) spectroscopy refers to the process in which an electron is removed from a specimen after the atomic absorption of a photon. The first evidence of this phenomenon dates back to 1887 but it was not until 1905 that Einstein offered an explanation of this effect, known as photoelectron) spectroscopy refers to the process in which an electron is removed from a specimen after the atomic absorption of a photon. The first evidence of this phenomenon dates back to 1887 but it was not until 1905 that Einstein offered an explanation of this effect, known as photoelectron) spectroscopy refers to the process in which an electron is removed from a specimen after the atomic absorption of a photon. The first evidence of this phenomenon dates back to 1887 but it was not until 1905 that Einstein offered an explanation of this effect, known as photoelectron) spectroscopy refers to the process in which an electron is removed from a specimen after the atomic absorption of a photon. The first evidence of this phenomenon dates back to 1887 but it was not until 1905 that Einstein offered an explanation of this effect, known as photoelectron) spectroscopy refers to the process in which an electron is removed from a specimen after the atomic absorption of a photon. The first evidence of this phenomenon dates back to 1887 but it was not until 1905 that Einstein offered an explanation of this effect, known as photoelectron) spectroscopy refers to the process in which an electron is removed from a specimen after the atomic absorption of a photon. The first evidence of this phenomenon dates back to 1887 but it was not until 1905 that Einstein offered an explanation of this effect, known as photoelectron) spectroscopy refers to the process in which an electron is removed from a specimen after the atomic absorption of a photon. The first evidence of this phenomenon dates back to 1887 but it was not until 1905 that Einstein offered an explanation of this effect, known as photoelectron) spectroscopy refers to the process in which an electron is removed from a specimen after the atomic absorption of a photon. The first evidence of this phenomenon dates back to 1887 but it was not until 1905 that Einstein offered an explanation of this effect, known as photoelectron) spectroscopy refers to the process in which an electron is removed from a specimen after the atomic absorption of a photon. The first evidence of this phenomenon dates back to 1887 but it was not until 1905 that Einstein offered an explanation of this effect, known as photoelectron) spectroscopy refers to the process in which an electron is removed from a specimen after the atomic absorption of a photon. The first evidence of this phenomenon dates back to 1887 but it was not until 1905 that Einstein offered an explanation of this effect, known as photoelectron) spectroscopy refers to the process in which an electron is removed from a specimen after the atomic absorption of a photon. The first evidence of this phenomenon dates back to 1887 but it was not until 1905 that Einstein offered an explanation of this effect, known as photoelectron) spectroscopy refers to the process in which an electron is removed from a specimen after the atomic absorption of a photon. The first evidence of this phenomenon dates back to 1887 but it was not until 1905 that Einstein offered an explanation of this effect, known as photoelectron) spectroscopy refers to the process in which an electron is removed from a specimen after the atomic absorption of a photon. The first evidence of this phenomenon dates back to 1887 but it was not until 1905 that Einstein offered an explanation of this effect, known as...
as several theories. As forming this foundation, the authors explore more advanced features of XPS, XAS, XMCD, and XES. Topics discussed include hard XPS, resonant photoemission, spin polarization, electron energy loss spectroscopy (EELS), and resonant inelastic x-ray scattering (RIXS). The book is structured around core level spectroscopy and is best suited for advanced graduate students in physics, chemistry, and earth metal systems. Pioneers in the theoretical and experimental developments of this field, Frank de Groot and Akio Kotani provide an invaluable treatise on the numerous aspects of core level spectroscopy that involve solids.

Provides a concise yet comprehensive introduction to XPS and AES techniques in surface analysis This accessible second edition of the bestselling book, An Introduction to Surface Analysis by XPS and AES, 2nd Edition explores the basic principles and applications of X-ray Photoelectron Spectroscopy (XPS) and Auger Electron Spectroscopy (AES) techniques in an approachable manner, with descriptions of core electron spectroscopy and electron spectrometers. It offers an accessible guide to the theoretical and qualitative and quantitative interpretation of the electronic spectrum. Chapters examine recent innovations in instrument design and key applications in metallurgy, biomaterials, and electronics. Practical and concise, it includes compositional depth profiling, multi-technique analysis; and everything about samples—including their handling, preparation, stability, and more. Topics discussed in more depth include peak fitting, energy loss background analysis, multi-technique analysis, depth profiling. The book includes chapters on applications of electron spectrometers and the comparison of XPS and AES with other analytical techniques. Extensively revised and updated with new material on NAPXPS, twin anode monochromators, gas cluster ion sources, valence band spectra, hydrogen detection, and quantification.

Explores key spectroscopic techniques in surface analysis Provides descriptions of latest instruments and techniques includes a detailed glossary of key surface analysis terms Features extensive bibliography of key references and additional reading Uses a non-theoretical style to appeal to industrial surface analysis sectors A practical introduction to Surface Analysis by XPS and AES, 2nd Edition is an excellent introductory text for undergraduates, first-year postgraduates, and industrial users of XPS and AES.

Fluorinated ionomers polymers form impermeable membranes that conduct electricity, properties that have been put to use in large-scale electrochemical applications, such as fuel cells, metal-ion recovery, water electrolysis, plating, surface treatment of metals, batteries, sensors, drug release technologies, gas drying and humidification, and super-acid catalysts used in the production of specialty chemicals. Walther Grot, who invented Nafton® while working for DuPont, has written this book as a practical guide to engineers and scientists working in electrochemistry, the polymer and other anion exchange group, as well as the polymer group. His book is a practical guide to this important part of the field and the application of Nafton®.

The 2e expands this handbook by over a third, with new sections covering developments in electroanalysis, additional information about the synthesis and science of the polymer group, and an enhanced provision of reference data. An essential reference for scientists working with electrochemistry and electrochemical processes, the use of this polymer group in industrial chemistry processes, and with a 1% replacing by replacing in global electricity usage, the techniques involving Nafton® are growing range of applications. A truly unique and valuable handbook, Nafton® contains Nafton® for the first time, while replacing with Nafton® has been shown to improve several important properties of novel Nafton® ionomers, including fuel cells, batteries and drug delivery.

The only book on this important polymer group, written by Walther Grot, the inventor of the leading fluorinated ionomer, Nafton® from DuPont Carbon nanotubes (CNTs), discovered in 1991, have been a subject of intensive research for a wide range of applications. These one-dimensional (1D) graphene sheets rolled into a tubular form have been the target of many researchers around the world. This book concentrates on the semiconductor physics of carbon nanotubes, it brings unique insight into the phenomena encountered in the electronic transport of carbon nanotubes. The book also provides useful information on the fabrication and applications of these outstanding materials. The main objective of this book is to give in-depth understanding of the physics and electronic structure of carbon nanotubes.

Readers of this book should have a strong background on physical electronics and semiconductor physics. This book first discusses fabrication techniques followed by an analysis on the physical properties of carbon nanotubes. Ultimately, the book pursues a significant amount of work on the synthesis and characterization of carbon nanotubes.

Photoemission (also known as photoelectron spectroscopy) refers to the process in which an electron is removed from a specimen after the atomic absorption of a photon. The first evidence of this phenomenon dates back to 1887 but it was not until 1905 that Einstein offered an explanation of this effect, which is now referred to as "the photoelectric effect". Quantitative Core Level Photoelectron Spectroscopy: A Primer tackles the pragmatic aspects of the photoemission process with the aim of introducing the reader to the concepts and instrumentation that emerge from an experimental approach. The basic elements implemented for the technique are discussed and the geometry of the instrument is explained. The book covers each of the features that have been observed in the X-ray photoemission spectra and provides the tools necessary for their understanding and correct identification. Charging effects are covered in the penultimate chapter with the final chapter bringing closure to the basic uses of the X-ray photoemission process, as well as guiding the reader through some of the most popular applications used in current research.

Nanomaterials for Green Energy focuses on the synthesis, characterization and application of novel nanomaterials in the fields of green science and technology. This book contains fundamental information about the properties of novel nanomaterials and their application in green energy. In particular, synthesis and characterization of novel nanomaterials, their application in solar and fuel cells and batteries, and nanomaterials for a low-toxicity environment are discussed. It will provide an important reference resource for researchers in materials science and renewable energy who wish to learn more about how nanomaterials are used to create more efficient novel methods and products. It provides a comprehensive overview of the latest research, synthesis, and characterization of novel nanomaterials for green energy. Shows how novel nanomaterials are used to create more efficient solar cells. Offers solutions to common problems related to the use of materials in the development of energy-related technologies. Representing the first text to cover this exciting new area of research, this book will describe synthesis techniques of CNWs, their characterization and various expected applications using CNWs.

Carbon-nanowalls (CNWs) can be described as two-dimensional graphite nanostructures with edges comprised of stacks of plane graphene sheets standing almost vertically on the substrate. These sheets form a wall structure with a high aspect ratio. The thickness of CNWs ranges from a few nm to a few tens of nm. The large surface area and sharp edges of CNWs may prove useful for a number of applications such as electrochemical devices, field electron emitters, storage materials for hydrogen gas, catalyst support. In particular, vertically standing CNWs with a high surface-to-volume ratio, serve as an ideal material for catalyst support for fuel cells and in gas storage materials. These three volumes provide comprehensive information about the instrument, the samples, and the methods used to collect the spectra. The spectra are presented on a landscape format and cover a wide variety of elements, polymers, semiconductors, and other materials. Offers a clear presentation of spectra with the right amount of experimental detail. All of the experiments have been conducted under controlled conditions on the same instrument by world-renowned expert. This book provides the first complete and up-to-date summary of the state of the art in HAXPES and provides useful tools to harness its full potential by experts. They cover theoretical, technical, modern instrumentation, theory and applications. This book spans from physics to chemistry and materials science and engineering.

In consideration of the rapid development of the technique, several chapters include highlighting future opportunities as well. This is an updated manual covering the theory and practice of X-ray photoelectron spectroscopy (XPS) and Auger electron spectroscopy (AES) techniques for surface analysis. Topics covered include historical development; all relevant theory for data interpretation and a description of important major fields of application: polymers, semiconductors, catalysis and many more. This revised edition of one of the earliest and best known books on the subject has been updated to bring into teaching the latest developments in research and the current hot topics in the field. In order to further enhance the functionality of this text, the authors have added numerous teaching aids that include an interactive website that features testing, examples in MathCAD with variable quantities and options, hotlinks to relevant text sections from the book, and online self-grading tests. As in the previous edition, readers can closely follow the structure of the chapters from the broad introduction through the more in depth descriptions of radiochemistry then nuclear radiation chemistry and finally the guide to nuclear energy (including energy production, fuel cycle, and waste management). New edition of a well-known,
respected text in the specialized field of nuclear/radiochemistry includes an interactive website with testing and evaluation modules based on exercises in the book. Suitable for both radiochemistry and nuclear chemistry courses, Peak Fitting with CasaxPS provides practical guidance, as well as outlining the theoretical background particular to quantitative surface analysis by XPS. The highly acclaimed Encyclopedia of Analytical Chemistry provides a much needed professional level reference work for the 21st Century providing the most comprehensive analytical chemistry reference available, covering all aspects from theory and instrumentation through applications and techniques. The chemistry and techniques are described as performed in the laboratory (environmental, clinical, QC, research, university), in the field or by remote sensing. The level of detail is similar to that of a lab protocol and together with the cited references, will support the analysis of complex inorganic, organic and biological structures by academic and industrial researchers. This 18 Volume Set includes 15 volumes published in 2000, with three supplementary volumes published in 2011, ensuring that this remains the most comprehensive analytical chemistry reference available. The three new volumes include 95 new articles published on Wiley InterScience/Wiley Online Library from 2008 – 2010 and cover hot topics such as: Terahertz Spectroscopy, Raman Spectroscopy of Polymers, Electrochemical Detection of Proteins, Quantitative Proteomics, Thermal Lens Spectroscopy, Preanalytical Variation in Clinical Laboratory Testing, etc. Encyclopedia of Analytical Chemistry is the essential cross-disciplinary reference work for all analytical chemists in academia and industry. All fields of chemical research are covered: analytical, organic, physical, polymer, inorganic biomedical, environmental, pharmaceutical, industrial, petroleum, forensics and food science. Analytical Pyrolysis presents the Proceedings of the Third International Symposium on Analytical Pyrolysis, held in Amsterdam on September 7-9, 1976. It looks at newly emergent techniques in analytical pyrolysis, including pyrolysis mass spectrometry, gas chromatography, thin-layer chromatography, and pyrolysis-gas liquid chromatography. The book also covers topics ranging from automation and microbiology to forensic science and pharmacology, reproducibility and specificity, biochemistry, laser-induced pyrolysis, pyrolytic reaction mechanisms, and polymers. Comprised of 50 chapters, this book begins with a discussion of automatic analysis of tire rubber blends using computer-linked pyrolysis gas chromatography, thermal procedures in coupling with thin-layer chromatography, the role of pyrolysis-gas liquid chromatography in biomedical studies, and the identification of microorganisms by pyrolysis gas-liquid chromatography. It then examines forensic applications of analytical pyrolysis techniques, structure and degradation behavior of synthetic polymers using pyrolysis in combination with field ion mass spectrometry, determination of polysaccharides in fulvic acids by pyrolysis gas chromatography, and application of Curie-point pyrolysis mass spectrometry in fungal taxonomy. The reader is also introduced to pyrolysis mass spectrometry of model compounds labeled with stable isotopes, the use of pyrolysis/IR chromatography to determine the quality of porous polymers of styrene cross-linked with divinyl benzene, and application of pyrolysis/gas chromatography to study the pyrolysis of lignin. This volume will benefit students, researchers, chemists, and scientists working in the field of analytical pyrolysis. High temperature gas-solid reactions are ubiquitous on planetary bodies, distributing chemical elements over a range of geologic settings and temperatures. This volume reviews the critical role gas-solid reactions play in early solar system formation, volcanism, metamorphism and industrial processes. The field evidence, experimental and theoretical approaches for examining gas-solid reactions are presented, building on advances in fields outside of Earth Sciences. Computational chemistry techniques are used to probe the nature of molecular clusters and solvation in volcanic vapors and mineral-gas reaction mechanisms. Specialised analytical methods for characterising solid reaction products are included since these reactions commonly form thin or dispersed films and metastable minerals. Finally, the volume contains rich field examples, laboratory experiments and thermodynamic modelling and kinetics of gas-solid reactions on Earth, Venus and beyond. Methods of Surface Analysis deals with the determination of the composition of surfaces and the identification of species attached to the surface. The text applies methods of surface analysis to obtain a composition depth profile after various stages of ion etching or sputtering. The composition at the solid–solid interface is revealed by systematically removing atomic planes once the interface of interest is reached, in which the investigator can then determine its composition. The book reviews the effect of ion etching on the results obtained by any method of surface analysis including the effect of the rate of etching, incident energy of the bombarding ion, the properties of the solid, the effect of the ion etching on generating an output signal of electrons, ions, or neutrals. The text also describes the effect of the residual gases in the vacuum environment. The book considers the influence of the sample geometry, of the type (metal, insulator, semiconductor, organic), and of the atomic number can have on surface analysis. The text describes in detail low energy ion scattering spectroscopy, X-ray photoelectron spectroscopy, Auger electron spectroscopy, secondary ion mass spectroscopy, and infrared reflection-absorption spectroscopy. The book can prove useful for researchers, technicians, and scientists whose works involve organic chemistry, analytical chemistry, and other related fields of chemistry, such as physical chemistry or inorganic chemistry. Expanding on the ideas first presented in Gerhard Ertl’s acclaimed Baker Lectures at Cornell University, Reactions at Solid Surfaces comprises an authoritative, self-contained book-length introduction to surface reactions for both professional chemists and students alike. Outlining our present understanding of the fundamental processes underlying reactions at solid surfaces, the book provides the reader with a complete view of how chemistry works at surfaces, and how to understand and probe the dynamics of surface reactions. Comparing traditional surface probes with more modern ones, and bringing together various disciplines in a cohesive manner, Gerhard Ertl’s Reactions at Solid Surfaces serves well as a primary text for graduate students in introductory surface science or chemistry, as well as a self-teaching resource for professionals in surface science, chemical engineering, or nanoscience.