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A Practical Guide for the Preparation of Specimens for X-Ray Fluorescence and X-Ray Diffraction Analysis *User's Guide for Inslope3* **X-Ray Diffraction Collection of Simulated XRD Powder Patterns for Zeolites Fifth (5th) Revised Edition** Clay Minerals **X-Ray Diffraction for Materials Research** Elements of X-Ray Diffraction: Pearson New International Edition PDF eBook Two-Dimensional X-Ray Diffraction **Theory of XRF : getting acquainted with the principles Crystal Structure Refinement** Crystallographic Instrumentation *Two-dimensional X-ray Diffraction* **Thin Film Analysis by X-Ray Scattering X-Ray Multiple-Wave Diffraction Low-Temperature X-Ray Diffraction** Crystallography Made Crystal Clear *Pharmaceutical Crystallography* **Crystallography Made Crystal Clear** A Practical Guide to Microstructural Analysis of Cementitious Materials **Elements of X Ray Diffraction X-Ray Optics Crystal Structure Determination Solid State Development and Processing of Pharmaceutical Molecules** Industrial Applications of X-Ray Diffraction **Dynamical Theory of X-ray Diffraction Modern X-Ray Analysis on Single Crystals Registry of toxic effects of chemical substances. 1985/86 User's guide |publ AP 1987** *Fundamentals of Powder Diffraction and Structural Characterization of Materials* **Fundamentals of Powder Diffraction and Structural Characterization of Materials, Second Edition Structure from Diffraction Methods Eleventh European Powder Diffraction Conference Industrial Applications of X-Ray Diffraction** *X-ray Diffraction Topography* **Structure Determination by X-ray Crystallography** *Crystal Structure Refinement* **Nanoscale Materials** *X-Ray Structure Determination* **X-Ray Crystallography of Biomacromolecules** Introduction to Texture Analysis **Diffraction Optics of Complex-Structured Periodic Media**

X-ray crystallography provides us with the most accurate picture we can get of atomic and molecular structures in crystals. It provides a hard bedrock of structural results in chemistry and in mineralogy. In biology, where the structures are not fully crystalline, it can still provide valuable results and, indeed, the impact here has been revolutionary. It is still an immense field for young workers, and no doubt will provide yet more striking developments of a major character. It does, however, require a wide range of intellectual application, and a considerable ability in many fields. This book will provide much help. It is a very straightforward and thorough guide to every aspect of the subject. The authors are ex perienced both as research workers and as teachers of standing, and this is shown in their clarity of exposition. There are plenty of illustrations and worked examples to aid the student to obtain a real grasp of the subject. The practical side is encouraged by the very clarity of the theory. Accompanying CD-ROM contains all the files necessary to reproduce the refinements covered in the text. With contributions by Paul F. Fewster and Christoph Genzel While X-ray diffraction investigation of powders and polycrystalline matter was at the forefront of materials science in the 1960s and 70s, high-tech applications at the beginning of the 21st century are driven by the materials science of thin films. Very much an interdisciplinary field, chemists, biochemists, materials scientists, physicists and engineers all have a common interest in thin films and their manifold uses and applications. Grain size, porosity, density, preferred orientation and other properties are important to know: whether thin films fulfill their intended function depends crucially on their structure and morphology once a chemical composition has been chosen. Although their backgrounds differ greatly, all the involved specialists a profound understanding of how structural properties may be determined in order to perform their respective tasks in search of new and modern materials, coatings and functions. The author undertakes this in-depth introduction to the field of thin film X-ray characterization in a clear and precise manner. Low-temperature X-ray diffraction (LTXRD) investigations offer many challenges to the diffractionist, not all of which are technical or scientific in nature. LTXRD studies can be frustrating: There are at least two reports of investigations ruined by the loss of crystals (grown with extreme difficulty) because of the widespread power failure and blackout in the northeastern United States in late 1965. LTXRD studies can cause discomfort: In several instances, "low temperatures" have been attained by opening all the windows in the X-ray laboratory. LTXRD studies can be dangerous: It was once reported that a crys tal was lost because a laboratory assistant fell down a flight of stairs and lay unconscious for about an hour on his way to refilling a liquid-nitrogen (LN2) dewar. This last report indicated the disposition of the crystal but not that of the laboratory assistant. However, in general, the results of low-temperature X-ray diffraction investigations cannot be obtained in any other manner, and one is well compensated for the effort expended in constructing and maintaining a low-temperature system. Crystal-structure analyses of solidified liquids and gases, phase transformation investigations, accurate crystal-structure analy ses and electron-density maps, thermal expansion measurements, and defect structure studies are a few of the many important applications of LTXRD. This 5th edition of the Zeolite Powder Pattern Collection contains calculated patterns of 218 zeolite materials representing 174 framework topologies. The almost exponential growth of new zeolite topologies reflects the continued success of zeolite synthesis researchers in producing novel materials. Collection of Simulated XRD Powder Patterns for Zeolites includes materials of interest to zeolite scientists following the policies established at recent IZA conferences. The materials included have corner-sharing tetrahedral frameworks with no restrictions on chemical composition. Covers an increase of 41 new topologies since the 4th edition in 2001 Data collected from diverse literature sources Represents an extensive compilation of data An indispensable resource for researchers and students in materials science, chemistry, physics, and pharmaceuticals Written by one of the pioneers of 2D X-Ray Diffraction, this updated and expanded edition of the definitive text in the field provides comprehensive coverage of the fundamentals of that analytical method, as well as state-of-the art experimental methods and applications. Geometry convention, x-ray source and optics, two-dimensional detectors, diffraction data interpretation, and configurations for various applications, such as phase identification, texture, stress, microstructure analysis, crystallinity, thin film analysis, and combinatorial screening are all covered in detail. Numerous experimental examples in materials research, manufacture, and pharmaceuticals are provided throughout. Two-dimensional x-ray diffraction is the ideal, non-destructive analytical method for examining samples of all kinds including metals, polymers, ceramics, semiconductors, thin films, coatings, paints, biomaterials, composites, and more. Two-Dimensional X-Ray Diffraction, Second Edition is an up-to-date resource for understanding how the latest 2D detectors are integrated into diffractometers, how to get the best data using the 2D detector for diffraction, and how to interpret this data. All those desirous of setting up a 2D diffraction in their own laboratories will find the author’s coverage of the physical principles, projection geometry, and mathematical derivations extremely helpful. Features new contents in all chapters with most figures in full color to reveal more details in illustrations and diffraction patterns Covers the recent advances in detector technology and 2D data collection strategies that have led to dramatic increases in the use of two-dimensional detectors for x-ray diffraction Provides in-depth coverage of new innovations in x-ray sources, optics, system configurations, applications and data evaluation algorithms Contains new methods and

experimental examples in stress, texture, crystal size, crystal orientation and thin film analysis Two-Dimensional X-Ray Diffraction, Second Edition is an important working resource for industrial and academic researchers and developers in materials science, chemistry, physics, pharmaceuticals, and all those who use x-ray diffraction as a characterization method. Users of all levels, instrument technicians and X-ray laboratory managers, as well as instrument developers, will want to have it on hand. This textbook gives a concise introduction to modern crystal structure determination, emphasising both its theoretical background and the way it is actually carried out. The theoretical sections are supported by many illustrations, and lay emphasis on a good understanding rather than rigorous mathematics. The most important data collection techniques, and the methods of data reduction, structure solution and refinement are discussed from a practical point of view. Many tips and insights help readers to recognise and avoid possible errors and traps, and to judge the quality of results. The second edition has been considerably updated, especially the chapter on experimental methods, which is now mainly concerned with modern data collection using area-detectors. The generation of radiation with well-defined frequency and wavelength, and the ability to precisely determine these quantities, are of fundamental importance in physics and other natural sciences. Monochromatic radiation enables both very accurate structure determinations and studies of the dynamics of living and non-living matter. It is crucial for the realization of standards of time and length, for the determination of fundamental constants, and for many other aspects of basic research. Bragg backscattering from perfect crystals is a tool for creating, manipulating, and analyzing x-rays with highest spectral purity. It has the unique feature of selecting x-rays with narrow spectral bandwidth. This book describes the theoretical foundations and principles of x-ray crystal optics with high spectral resolution. Various experimental studies and applications are presented and the author also addresses the development of instrumentation, such as high-resolution x-ray monochromators, analyzers, wavelength meters, resonators, and interferometers. The book will be a valuable source of information for all students and researchers working in the field of x-ray optics. X-Ray Diffraction Topography presents an elementary treatment of X-ray topography which is comprehensible to the non-specialist. It discusses the development of the principles and application of the subject matter. X-ray topography is the study of crystals which use x-ray diffraction. Some of the topics covered in the book are the basic dynamical x-ray diffraction theory, the Berg-Barrett method, Lang's method, double crystal methods, the contrast on x-ray topography, and the analysis of crystal defects and distortions. The crystals grown from solution are covered. The naturally occurring cr. Inorganic materials show a diverse range of important propertiesthat are desirable for many contemporary, real-world applications.Good examples include recyclable battery cathode materials forenergy storage and transport, porous solids for capture and storageof gases and molecular complexes for use in electronic devices. Anunderstanding of the function of these materials is necessary inorder to optimise their behaviour for real applications, hence theimportance of 'structure–property relationships'. The chapters presented in this volume deal with recent advancesin the characterisation of crystalline materials. They include somefamiliar diffraction methods, thoroughly updated with modernadvances. Also included are techniques that can now probe detailsof the three-dimensional arrangements of atoms in nanocrystallinesolids, allowing aspects of disorder to be studied. Small-anglescattering, a technique that is often overlooked, can probe bothordered and disordered structures of materials at longer lengthscales than those probed by powder diffraction methods. Addressing both physical principals and recent advances in theirapplications, Structure from Diffraction Methodscovers: Powder Diffraction X-Ray and Neutron Single-Crystal Diffraction PDF Analysis of Nanoparticles Electron Crystallography Small-Angle Scattering Ideal as a complementary reference work to other volumes in theseries (Local Structural Characterisation and MultiLength-Scale Characterisation), or as an examination of thespecific characterisation techniques in their own right,Structure from Diffraction Methods is a valuable addition tothe Inorganic Materials Series. The dynamical theory of diffraction has witnessed exciting developments since the advent of synchrotron radiation. The present book is an up-to-date account of the theory of diffraction and its applications. The first part serves as an introduction to the subject, presenting the earlydevelopments and the basic results. It is followed by a detailed development of the diffraction and propagation properties of x-rays in perfect crystals and by an extension of the theory to the case of slightly and highly deformed crystals. The last part gives three applications of the theory: X-rayoptics for synchrotron radiation, locations of atoms at surfaces, and X-ray diffraction topography. The book is richly illustrated and contains a wide range of references to the literature. It will be a useful reference work for graduate students, lecturers, and researchers. Closely follows an actual structural determination. After some introductory material on the nature of x-rays, the diffraction process, and the internal geometry of crystals, the selection and preparation of a crystal are considered. Techniques of measuring raw x-ray data are covered, plus their reduction into a useable form. The second part discusses both traditional and novel methods of solving the ``phase'' problem, the principal difficulty in x-ray structure determination. The third part considers how to extract the most information from the data and how to evaluate its reliability. Finally, there is a discussion of sources of error in practice and interpretation. Crystal Structure Refinement is a mixture of textbook and tutorial. As A Crystallographers Guide to SHELXL it covers advanced aspects of practical crystal structure refinement, which have not been much addressed by textbooks so far. After an introduction to SHELXL in the first chapter, a brief survey of crystal structure refinement is provided. Chapters three and higher address the various aspects of structure refinement, from the treatment of hydrogen atoms to the assignment of atom types, to disorder, to non-crystallographic symmetry and twinning. One chapter is dedicated to the refinement of macromolecular structures and two short chapters deal with structure validation (one for small molecule structures and one for macromolecules). In each of the chapters the book gives refinement examples, based on the program SHELXL, describing every problem in detail. It comes with a CD-ROM with all files necessary to reproduce the refinements. Requires no prior knowledge of the subject, but is comprehensive and detailed making it useful for both the novice and experienced user of the powder diffraction method. Useful for any scientific or engineering background, where precise structural information is required. Comprehensively describes the state-of-the-art in structure determination from powder diffraction data both theoretically and practically using multiple examples of varying complexity. Pays particular attention to the utilization of Internet resources, especially the well-tested and freely available computer codes designed for processing of powder diffraction data. Organized nanoassemblies of inorganic nanoparticles and organic molecules are building blocks of nanodevices, whether they are designed to perform molecular level computing, sense the environment or improve the catalytic properties of a material. The key to creation of these hybrid nanostructures lies in understanding the chemistry at a fundamental level. This book serves as a reference book for researchers by providing fundamental understanding of many nanoscopic materials. Probing matter with beams of photons, neutrons and electrons provides the main source of information about both the microscopic and macroscopic structure of materials. This is particularly true of media, such as crystals and liquid crystals, that have a periodic structure. This book discusses the interaction of waves (which may represent x-rays, gamma rays, electrons, or neutrons) with various kinds of ordered media. After two chapters dealing with exact and approximate solutions to the scattering problem in periodic media in general, the author discusses: the diffraction of Mößbauer radiation in magnetically ordered crystals; the optics of chiral liquid crystals; the radiation of fast particles in regular media (Cherenkov radiation); nonlinear optics of periodic media; neutron scattering in magnetically ordered media; polarization phenomena in x-ray optics; magnetic x-ray scattering; and Mößbauer filtration of synchrotron radiation. This work has been selected by scholars as being culturally important and is part of the knowledge base of civilization as we know it. This work is in the public domain in the United States of America, and possibly other nations. Within the United States, you may freely copy and distribute this work, as no entity (individual or corporate) has a copyright on the body of the work. Scholars believe, and we concur, that this work is important enough to be preserved, reproduced, and made generally available to the public. To ensure a quality reading experience, this work has been proofread and republished using a format that seamlessly blends the original graphical

elements with text in an easy-to-read typeface. We appreciate your support of the preservation process, and thank you for being an important part of keeping this knowledge alive and relevant. This comprehensive text describes the fundamentals of X-ray multiple-wave interaction in crystals and its applications in condensed matter physics and crystallography. It covers current theoretical approaches and application methods for many materials, including macromolecular crystals, thin films, semiconductors, quasicrystals and nonlinear optical materials. X-ray optics is also addressed. Designed primarily as a reference for researchers in condensed matter, crystallography, materials science, and synchrotron-related topics, the book will also be useful as a textbook for graduate and senior-year undergraduate courses on special topics in X-ray diffraction. This text provides an up-to-date overview of crystallographic instrumentation and methods of diffraction measurements used for crystal and molecular structure determination. The book provides a unique description of both principles and specific instruments, and methods for data collection,adjustment of instruments, and primary data processing and error correction. Taking an intuitive and informal approach to solid-state structure and crystallographic concepts, this book is written for anyone who needs a clear understanding of modern crystallography An excellent book for professional crystallographers! In 2012 the crystallographic community celebrated 100 years of X-ray diffraction in honour of the pioneering experiment in 1912 by Max von Laue, Friedrich and Knipping. Experimental developments e.g. brilliant X-ray sources, area detection, and developments in computer hardware and software have led to increasing applications in X-ray analysis. This completely revised edition is a guide for practical work in X-ray analysis. An introduction to basic crystallography moves quickly to a practical and experimental treatment of structure analysis. Emphasis is placed on understanding results and avoiding pitfalls. Essential reading for researchers from the student to the professional level interested in understanding the structure of molecules. A Practical Guide from Top-Level Industry Scientists As advanced teaching and training in the development of cementitious materials increase, the need has emerged for an up-to-date practical guide to the field suitable for graduate students and junior and general practitioners. Get the Best Use of Different Techniques and Interpretations of the Results This edited volume provides the cement science community with a state-of-the-art overview of analytical techniques used in cement chemistry to study the hydration and microstructure of cements. Each chapter focuses on a specific technique, not only describing the basic principles behind the technique, but also providing essential, practical details on its application to the study of cement hydration. Each chapter sets out present best practice, and draws attention to the limitations and potential experimental pitfalls of the technique. Databases that supply examples and that support the analysis and interpretation of the experimental results strengthen a very valuable ready reference. Utilizing the day-to-day experience of practical experts in the field, this book: Covers sample preparation issues Discusses commonly used techniques for identifying and quantifying the phases making up cementitious materials (X-ray diffraction and thermogravimetric analysis) Presents good practice oncalorimetry and chemical shrinkage methods for studying cement hydration kinetics Examines two different applications of nuclear magnetic resonance (solid state NMR and proton relaxometry) Takes a look at electron microscopy, the preeminent microstructural characterization technique for cementitious materials Explains how to use and interpret mercury intrusion porosimetry Details techniques for powder characterization of cementitious materials Outlines the practical application of phase diagrams for hydrated cements Avoid common pitfalls by using A Practical Guide to Microstructural Analysis of Cementitious Materials. A one-of-a-kind reference providing the do’s and don’ts of cement chemistry, the book presents the latest research and development of characterisation techniques for cementitious materials, and serves as an invaluable resource for practicing professionals specializing in cement and concrete materials and other areas of cement and concrete technology. Written by one of the pioneers of 2D X-Ray Diffraction, this useful guide covers the fundamentals, experimental methods and applications of two-dimensional x-ray diffraction, including geometry convention, x-ray source and optics, two-dimensional detectors, diffraction data interpretation, and configurations for various applications, such as phase identification, texture, stress, microstructure analysis, crystallinity, thin film analysis and combinatorial screening. Experimental examples in materials research, pharmaceuticals, and forensics are also given. This presents a key resource to researchers in materials science, chemistry, physics, and pharmaceuticals, as well as graduate-level students in these areas. Zeitschrift für Kristallographie. Supplement Volume 30 presents the complete Proceedings of all contributions to the XI European Powder Diffraction Conference in Warsaw 2008:Method Development and Application, Instrumental, Software Development, MaterialsSupplement Series of Zeitschrift für Kristallographie publishes Proceedings and Abstracts of international conferences on the interdisciplinary field of crystallography. In this, the only book available to combine both theoretical and practical aspects of x-ray diffraction, the authors emphasize a "hands on" approach through experiments and examples based on actual laboratory data. Part I presents the basics of x-ray diffraction and explains its use in obtaining structural and chemical information. In Part II, eight experimental modules enable the students to gain an appreciation for what information can be obtained by x-ray diffraction and how to interpret it. Examples from all classes of materials -- metals, ceramics, semiconductors, and polymers -- are included. Diffraction patterns and Bragg angles are provided for students without diffractometers. 192 illustrations. By illustrating a wide range of specific applications in all major industries, this work broadens the coverage of X-ray diffraction beyond basic tenets, research and academic principles. The book serves as a guide to solving problems faced everyday in the laboratory, and offers a review of the current theory and practice of X-ray diffraction, major This edition explains to graduate students and researchers the basics of crystallography for all macromolecules. This updated version contains 35 percent new material, concentrating on the tremendous advances in the desktop programs used for modeling. New topics include neutron and electron diffraction, protein structure determination by NMR, and recent developments in MAD phasing and high speed data collection in crystallography. Gale Rhodes makes crystallography accessible to readers who have no prior knowledge of the field, or its mathematical basis. The second edition has been fully updated and expanded to make it the most comprehensive and concise reference for beginning crystallographers. The book also introduces essential World Wide Web tools for users of models, including beginning-level tutorials in molecular modeling on personal computers. Solid State Development and Processing of Pharmaceutical Molecules A guide to the lastest industry principles for optimizing the production of solid state active pharmaceutical ingredients Solid State Development and Processing of Pharmaceutical Molecules is an authoritative guide that covers the entire pharmaceutical value chain. The authors—noted experts on the topic—examine the importance of the solid state form of chemical and biological drugs and review the development, production, quality control, formulation, and stability of medicines. The book explores the most recent trends in the digitization and automation of the pharmaceutical production processes that reflect the need for consistent high quality. It also includes information on relevant regulatory and intellectual property considerations. This resource is aimed at professionals in the pharmaceutical industry and offers an in-depth examination of the commercially relevant issues facing developers, producers and distributors of drug substances. This important book: Provides a guide for the effective development of solid drug forms Compares different characterization methods for solid state APIs Offers a resource for understanding efficient production methods for solid state forms of chemical and biological drugs Includes information on automation, process control, and machine learning as an integral part of the development and production workflows Covers in detail the regulatory and quality control aspects of drug development Written for medicinal chemists, pharmaceutical industry professionals, pharma engineers, solid state chemists, chemical engineers, Solid State Development and Processing of Pharmaceutical Molecules reviews information on the solid state of active pharmaceutical ingredients for their efficient development and production. Encompassing the concepts, practice, and application of orientation analysis, Introduction to Texture Analysis is an essential reference source for reserachers in textiles. The author uses an accessible style to share her expertise, providing comprehensive coverage of the theory and practice of the texture techniques now available and discusses their applications in research and industry. The text considers the merits of each technique for specific applications. Case

studies expand upon the author's explanations and help illustrate the main principles involved. Topics include applications of diffraction, SEM- and TEM-based techniques, and crystallographic analyses. The first hands-on guide to XRD and XRF sampling and specimen preparation Systematic errors from poor sampling and improper specimen preparation can easily render X-ray diffraction (XRD) and X-ray fluorescence (XRF) data of questionable use for analysis. But, until now, the practical information that can help to reduce these errors has never been readily available in one volume. This book fills a vital gap in the literature, bringing together a wealth of material previously available only in workbooks, company manuals, and other inside sources. It provides detailed coverage of the major tasks involved in X-ray analysis - complete with theory, step-by-step methods, equipment suggestions, and problem-solving tips. With a full complement of tools and techniques, this comprehensive guide helps both beginners and experienced analysts to make the best decision on sample treatment and get accurate XRD and XRF results-saving valuable time, money, and effort. Covers X-ray techniques for analyzing biological, geological, metallic, ceramic, and other materials * Addresses all aspects of specimen preparation, including handling unusual or very small samples, liquids and solutions, and more * Features special chapters on specimen preparation equipment and XRF standards * Contains useful bibliography and helpful references. X-ray diffraction is a useful and powerful analysis technique for characterizing crystalline materials commonly employed in MSE, physics, and chemistry. This informative new book describes the principles of X-ray diffraction and its applications to materials characterization. It consists of three parts. The first deals with elementary crystallography and optics, which is essential for understanding the theory of X-ray diffraction discussed in the second section of the book. Part 2 describes how the X-ray diffraction can be applied for characterizing such various forms of materials as thin films, single crystals, and powders. The third section of the book covers applications of X-ray diffraction. The book presents a number of examples to help readers better comprehend the subject. X-Ray Diffraction for Materials Research: From Fundamentals to Applications also • provides background knowledge of diffraction to enable nonspecialists to become familiar with the topics • covers the practical applications as well as the underlying principle of X-ray diffraction • presents appropriate examples with answers to help readers understand the contents more easily • includes thin film characterization by X-ray diffraction with relevant experimental techniques • presents a huge number of elaborately drawn graphics to help illustrate the content The book will help readers (students and researchers in materials science, physics, and chemistry) understand crystallography and crystal structures, interference and diffraction, structural analysis of bulk materials, characterization of thin films, and nondestructive measurement of internal stress and phase transition. Diffraction is an optical phenomenon and thus can be better understood when it is explained with an optical approach, which has been neglected in other books. This book helps to fill that gap, providing information to convey the concept of X-ray diffraction and how it can be applied to the materials analysis. This book will be a valuable reference book for researchers in the field and will work well as a good introductory book of X-ray diffraction for students in materials science, physics, and chemistry. Designed for Junior/Senior undergraduate courses. This revision of a classical text is intended to acquaint the reader, who has no prior knowledge of the subject, with the theory of x-ray diffraction, the experimental methods involved, and the main applications. The text is a collection of principles and methods designed directly for the student and not a reference tool for the advanced reader Written by one of the most significant contributors to the progress of protein crystallography, this practical guide contains case studies, a troubleshooting section and pointers on data interpretation. It covers the theory, practice and latest achievements in x-ray crystallography, such that any researcher in structural biology will benefit from this extremely clearly written book. Part A covers the theoretical basis and such experimental techniques as principles of x-ray diffraction, solutions for the phase problem and time-resolved x-ray crystallography. Part B includes case studies for different kinds of x-ray crystal structure determination, such as the MIRAS and MAD techniques, molecular replacement, and the difference Fourier technique. A little over ?ve years have passed since the ?rst edition of this book appeared in print. Seems like an instant but also eternity, especially considering numerous developments in the hardware and software that have made it from the laboratory test beds into the real world of powder diffraction. This prompted a revision, which had to be beyond cosmetic limits. The book was, and remains focused on standard laboratory powder diffractometry. It is still meant to be used as a text for teaching students about the capabilities and limitations of the powder diffraction method. We also hope that it goes beyond a simple text, and therefore, is useful as a reference to practitioners of the technique. The original book had seven long chapters that may have made its use as a text - convenient. So the second edition is broken down into 25 shorter chapters. The ?rst ?fteen are concerned with the fundamentals of powder diffraction, which makes it much more logical, considering a typical 16-week long semester. The last ten ch- ters are concerned with practical examples of structure solution and re?nement, which were preserved from the ?rst edition and expanded by another example – R solving the crystal structure of Tylenol . By illustrating a wide range of specific applications in all major industries, this work broadens the coverage of X-ray diffraction beyond basic tenets, research and academic principles. The book serves as a guide to solving problems faced everyday in the laboratory, and offers a review of the current theory and practice of X-ray diffraction, major advances and potential uses.

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