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HEIDI JOSIAH

Polymer Characterization CRC Press
Discerning the properties of polymers and polymer-based materials requires a good understanding of characterization. This revised and updated text provides a comprehensive survey of characterization methods within its simple, concise chapters. Polymer Characterization: Physical Techniques, provides an overview of a wide variety of characterization methods, which makes it an excellent textbook and reference. It starts with a description of basic polymer science, providing a solid foundation from which to understand the key physical characterization techniques. The authors explain physical principles without heavy theory and give special emphasis to the application of the techniques to polymers, with plenty of illustrations. Topics covered include molecular weight determination, molecular and structural characterization by spectroscopic techniques, morphology and structural characterization by microscopy and diffraction, and thermal analysis. This edition contains a new chapter on surface analysis as well as some revised problems and solutions. The concise treatment of each topic offers even those with little prior knowledge of the subject an accessible source to relevant, simple descriptions in a well-organized format.
Characterization of Polymer Blends Walter de Gruyter GmbH & Co KG
Presents the methods used for characterization of polymers. In addition to theory and basic principles, the instrumentation and apparatus necessary for methods used to study the kinetic and thermodynamic interactions of a polymer with its environment are covered in detail. Some of the methods examined include polymer separations and characterization by size exclusion and high performance chromatography, inverse gas chromatography, osmometry, viscometry, ultracentrifugation, light scattering and spectroscopy.
Polymer Analysis CRC Press
Molecular Characterization of Polymers presents a range of advanced and cutting-edge methods for the characterization of polymers at the molecular level, guiding the reader through theory, fundamentals, instrumentation, and applications, and supporting the end goal of efficient material selection and improved material performance. Each chapter focuses on a specific technique or family of techniques, including the different areas of chromatography, field flow fractionation, long chain branching, static and dynamic light scattering, mass spectrometry, NMR, X-Ray and neutron scattering, polymer dilute solution viscometry, microscopy, and vibrational spectroscopy. In each case, in-depth coverage explains how to successfully implement and utilize the technique. This practical resource is highly valuable to researchers and advanced students in polymer science, materials science, and engineering, and to those from other disciplines and industries who are unfamiliar with polymer characterization techniques. Introduces a range of advanced characterization methods, covering aspects such as molecular weight, polydispersity, branching, composition, and tacticity Enables the reader to understand and to compare the available technique, and implement the selected technique(s), with a view to improving properties of the polymeric material Establishes a strong link between basic principles, characterization techniques, and real-life applications
Polymer Characterization by Thermal Methods of Analysis William Andrew
Principles and Practices of Polymer Mass Spectrometry helps readers acquire the skills necessary for selecting the optimal methods, handling samples, analyzing the data, and interpreting the results of the mass spectrometry of polymers. This guide describes the principles of polymer MS and best practices in polymer characterization. It discusses different approaches, including MALDI, ESI, TOF MS, and FT-MS. It provides a guide to developing appropriate sample preparation protocols for different polymers. Complete with examples of applications and experiments, this is an excellent reference for scientists, researchers, graduate students, and others.
Polymer Analysis and Characterization Elsevier
This undergraduate text provides an introduction to the physical principles behind the various techniques of polymer characterization without becoming deeply theoretical. It contains much detail of a practical nature, and special emphasis is placed on applications. Paper edition (unseen), $36. Annotation(c) 2003 Book News, Inc., Portland, OR (booknews.com)
Polymer Characterization Interdisciplinary Approaches Nova Publishers
Thermal Analysis (TA) has become an indispensable family of analytical techniques in the polymer research. The increased importance of these techniques can be seen as the result of three more or less parallel developments: • a tempestuous development of TA measuring techniques in combination with a high degree of automation, • the strongly increased understanding of the underlaying theory and, • the increasing knowledge of the relation between the polymers' chemical structure and their physical properties. These areas are still in their developmental stages, especially the third area. The increasing knowledge of the dependence of physical properties on chemical structure just accentuated more and more the need for accurate thermoanalytical measurements, and this knowledge is very important for the first stages of the development of new polymeric systems. Besides, the contribution of TA remains necessary for the technical and commercial development of such a new polymer system. The use of the various TA techniques in these processes is described in this book in nine chapters, while chapter ten illustrates the information obtained about different polymers during special case studies. This book illustrates in this way, applications of a wide variety of TA techniques whilst it is written from a materials characterisation rather than from a TA point of view with attention being paid to the chemical structure/physical properties correlations.
Characterization and Analysis of Polymers by Gas Chromatography Springer Verlag
Analytical Methods for Polymer Characterization presents a collection of methods for polymer analysis. Topics include chromatographic methods (gas chromatography, inverse gas chromatography, and pyrolysis gas chromatography), mass spectrometry, spectroscopic methods (ultraviolet-visible spectroscopy, infrared spectroscopy, Raman spectroscopy, and nuclear magnetic resonance), thermal analysis (differential scanning calorimetry and thermogravimetry), microscopy methods (scanning electron microscopy, transmission electron microscopy, and atomic force microscopy), and x-ray diffraction. The author also discusses mechanical and dynamic mechanical properties.
Polymer Analysis and Characterization Chapman & Hall
Characterization of Polymers and Fibres addresses an integral part of fiber and polymer manufacturing processes that is crucial in helping manufacturers ensure that final products achieve intended specifications. The characterization of fiber and polymers is needed for attributes including molecular weight, morphology, dyeing behavior, tensile, optical and thermal behavior. This book covers a wide range of characterization techniques, including thermal, X-ray diffraction, solubility, tensile, optical, hygroscopic and particle size distribution. Introductions and definitions are provided where beneficial to make topics accessible to a broad range of readers in both academia and industry. Addressing advances from the fields of bioscience, polymer science, material science, and textile science, this book is wide in scope, drawing on the latest research to provide details of characterization techniques and equipment. Provides a thorough description of the material quality control process, including the latest industry practice Presents material characterization at all levels, from the atomic level to surface structure Covers technical advice on natural fiber characterization methods, including XRD, XPS, TGA, SEM, TEM, AFM, Contact angle, Particle size analysis, FTIR, and NMR
Polymer Characterization John Wiley & Sons

Molecular Characterization of Polymers presents a range of advanced and cutting-edge methods for the characterization of polymers at the molecular level, guiding the reader through theory, fundamentals, instrumentation, and applications, and supporting the end goal of efficient material selection and improved material performance. Each chapter focuses on a specific technique or family of techniques, including the different areas of chromatography, field flow fractionation, long chain branching, static and dynamic light scattering, mass spectrometry, NMR, X-Ray and neutron scattering, polymer dilute solution viscometry, microscopy, and vibrational spectroscopy. In each case, in-depth coverage explains how to successfully implement and utilize the technique. This practical resource is highly valuable to researchers and advanced students in polymer science, materials science, and engineering, and to those from other disciplines and industries who are unfamiliar with polymer characterization techniques. Introduces a range of advanced characterization methods, covering aspects such as molecular weight, polydispersity, branching, composition, and tacticity Enables the reader to understand and to compare the available technique, and implement the selected technique(s), with a view to improving properties of the polymeric material Establishes a strong link between basic principles, characterization techniques, and real-life applications

POLYMER characterization ASM International

In what is an extremely practical and applicable new work, experts provide concise explanations, with examples and illustrations, of the key techniques in this important field. In each case, after basic principles have been reviewed, applications of the experimental techniques are discussed and illustrated with specific examples. Scientists and engineers in research and development will benefit from an application-oriented book that helps them to find solutions to both fundamental and applied problems. They will know that the surfaces and interfaces of polymers play an important role in most of the application areas of polymers, from moulds, foils, and composites, to biomaterials and applications in micro- and nanotechnology.

Surface Characterization of Advanced Polymers Springer Science & Business Media

Presents a solid introduction to thermal analysis, methods,instrumentation, calibration, and application along with thenecessary theoretical background. Useful to chemists, physicists, materials scientists, andengineers who are new to thermal analysis techniques, and toexisting users of thermal analysis who wish expand their experienceto new techniques and applications Topics covered include Differential Scanning Calorimetry andDifferential Thermal Analysis (DSC/DTA), Thermogravimetry,Thermomechanical Analysis and Dilatometry, Dynamic MechanicalAnalysis, Micro-Thermal Analysis, Hot Stage Microscopy, andInstrumentation. Written by experts in the various areas of thermalanalysis Relevant and detailed experiments and examples follow eachchapter.

Polymer Analysis and Characterization John Wiley & Sons

- führt in Analysenmethoden ein, die für Polymere angewendet werden - deckt dabei alle wichtigen Gebiete der Polymerforschung und -technik ab, von der Identifizierung und Analytik über die Herstellung bis zum Abbau - jedes Verfahren wird übersichtlich beschrieben - mit vielen Fragen (und Antworten) zur Selbstkontrolle

Polymer Characterization Marcel Dekker

This volume provides an overview of polymer characterization test methods. The methods and instrumentation described represent modern analytical techniques useful to researchers, product development specialists, and quality control experts in polymer synthesis and manufacturing. Engineers, polymer scientists and technicians will find this volume useful in selecting approaches and techniques applicable to characterizing molecular, compositional, rheological, and thermodynamic properties of elastomers and plastics.

Characterization of Polymers and Fibers Elsevier

Polymers continue to play an ever increasing role in the modern world. In fact it is quite inconceivable to most people that we could ever have existed of the increased volume and variety of materials without them. As a result currently available, and the diversity of their application, characterisation has become an essential requirement of industrial and academic laboratories in volved with polymeric materials. On the one hand requirements may come from polymer specialists involved in the design and synthesis of new materials who require a detailed understanding of the relationship between the precise molecular architecture and the properties of the polymer in order to improve its capabilities and range of applications. On the other hand, many analysts who are not polymer specialists are faced with the problems of analysing and testing a wide range of polymeric materials for quality control or material specification purposes. We hope this book will be a useful reference for all scientists and techno or industrial laboratories, logists involved with polymers, whether in academic and irrespective of their scientific discipline. We have attempted to include in one volume all of the most important techniques. Obviously it is not possible to do this in any great depth but we have encouraged the use of specific examples to illustrate the range of possibilities. In addition numerous references are given to more detailed texts on specific subjects, to direct the reader where appropriate. The book is divided into II chapters.

Thermal Analysis of Polymers Elsevier

Physical and spectroscopic methods have been used jointly for characterization of polymers for at least four decades. Yet, new techniques permit increasingly refined determination of polymer chemistry and morphol ogy_ The correlation of this knowledge with physical properties of polymers is helpful to planned synthesis of new products. The most prominent spectroscopic techniques through the forties and fifties were infrared and ultraviolet spectroscopy. Nuclear magnetic resonance, electron spin resonance and MOssbauer spectroscopy started making sig nificant contributions to polymer chemistry in the early sixties. Still more recently fluorescence spectroscopy and laser Raman spectroscopy have become readily appli cable to polymers and are contributing significantly to the understanding of the relationship between polymer structure and properties. Determination of the distribution of monomer se quences by molecular size has become possible through combined gel permeation chromatography and spectroscopic analysis. Fragments of polymers from chemical break down or from pyrolysis are further fractionated and structurally analyzed. The relationship between the chemistry of polymers and performance can be determined from changes in chemical structure and orientation after curing, degradation, or physical or thermal manipulation of the polymers.

Characterisation of Polymers by Thermal Analysis Springer Science & Business Media

Discerning the properties of polymers and polymer-based materials requires a good understanding of characterization. This revised and updated text provides a comprehensive survey of characterization methods within its simple, concise chapters. Polymer Characterization: Physical Techniques, provides an overview of a wide variety of characterization methods, which makes it an excellent textbook and reference. It starts with a description of basic polymer science, providing a solid foundation from which to understand the key physical characterization techniques. The authors explain physical principles without heavy theory and give special emphasis to the application of the techniques to polymers, with plenty of illustrations. Topics covered include molecular weight determination, molecular and structural characterization by spectroscopic techniques, morphology and structural characterization by microscopy and diffraction, and thermal analysis. This edition contains a new chapter on surface analysis as well as some revised problems and solutions. The concise treatment of each topic offers even those with little prior knowledge of the subject an accessible source to relevant, simple descriptions in a well-organized format.

Thermal Characterization of Polymeric Materials Springer Science & Business Media

This volume is one of a series of selected reprints from the world-renowned Encyclopedia of Polymer Science and Engineering designed to provide specific audiences with articles grouped by a central theme. Included are all of the original articles related to polymer characterization and analysis, with full texts, tables, figures, and reference materials from the original--reproduced unchanged. Articles are by industrial or academic experts in their field. Includes coverage of the newest analytical methods, a wealth of physical and mechanical data, and standards and specifications for materials. Alphabetical organization, extensive cross-references, and a complete index further enhance its usefulness.

Molecular Characterization of Polymers Wiley

Written primarily to help the polymer chemist in streamlining his analytical techniques.

Polymer characterization by thermal methods of analysis Springer

This fully updated edition provides a broad approach to the surface analysis of polymers being of high technological interest. Modern analytical techniques, potential applications and recent advances in instrumental apparatus are discussed. The self-consistent chapters are devoted to spectroscopic and microscopic techniques which represent powerful tools for the characterization of morphology and chemical, physical, mechanical properties of polymer surfaces, interfaces, and thin fi lms. Selection of techniques which can properly address very shallow depth of surfaces, spanning from few angstroms to tens of nanometers Interaction of polymer surfaces with their surroundings is pointed out as a critical issue for specifi c applications

Thermal Analysis in Polymer Characterization John Wiley & Sons

Thermal Characterization of Polymeric Materials is a critical review and a concise evaluation of the application of thermal analysis in polymer science and engineering. This book is divided into nine chapters that specifically tackle the instrumentation, theory, and a wide variety of applications of thermal characterization. The introductory chapters provide an overview of all aspects of thermal analytical methods and apparatus and the theory underlying the basic principles of thermal analysis. These chapters also examine the theories and functions of state for thermometry, dilatometry, thermomechanical analysis, calorimetry, thermogravimetry. These topics are followed by a discussion on single-component and multicomponent systems and their phase transitions, as influenced by concentration, pressure, deformation, molecular weight, and copolymerization. The subsequent chapters explore the influence of important chemical and physical parameters on the glass transition, crystallization, and melting of thermoplastic materials. The discussion then shifts to the theoretical aspects of polymer-polymer compatibility, phase separation, and miscibility in mixed polymer systems. This book further considers the thermal analysis in thermosets, elastomers, and fibers. The concluding chapters present the methods of obtaining information on the relative flammability properties of polymers, for screening fire retardant additives, and for studying the mechanism of flame inhibition. These chapters also look into the thermal analysis of antioxidants, stabilizers, lubricants, plasticizers, impact modifiers, and fire retardants. Polymer scientists and researchers will find this book invaluable.