Chemistry And Technology Of Isocyanates

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Polyurethanes Royal Society of Chemistry
Carbodiimides play an important role as condensation agents in the synthesis of polypeptides, polynucleotides, polysaccharides and numerous other chemical transformations. Chemistry and Technology of Carbodiimides is the first book to examine both the chemistry and technology of carbodiimides. This book provides a comprehensive and in-depth coverage of the synthesis and reactions of this industrially important class of chemicals while focusing on industrial applications, including the $M-sectors of biochemical synthesis, pharmaceuticals, polymers, ceramics, and herbicides. Written by a well-known authority in the field this book will prove a valuable reference tool for anyone working in this area of chemistry.
New Concepts of Isocyanate Chemistry Springer Science & Business Media
Adhesives are indispensable. They are required pling agents, and other key ingredients. Special in myriad products-aircraft and abrasives, cars attention is given to such flourishing categories and cartons, shoes and safety glass, tape and as acrylics, anaerobics, cyanoacrylates, poly urethanes, epoxy resins, polyvinyl acetate, high tires. This Third Edition of Handbook of Ad hesives, like the 1962 and 1977 editions, seeks temperature adhesives, hot melts, silicones, and to provide the knowledge needed for optimum silanes. selection, preparation, and utilization of adhe The last 14 chapters, on adherends and bond sives and sealants. The information is detailed ing technology, involve the auto industry, air and explicit, with several hundred illustrative craft, electronics, the bonding of wood, formulations. textiles, rubber and plastics, construction, ab Expert information has been supplied in 47 rasives, pressure-sensitives, nonwovens, and chapters written by 70 industry specialists, pro sealants. Mechanical handling of two-compo fessors, and consultants. Five chapters on fun nent systems is examined. The concluding damentals provide the theoretical and economic chapter highlights the exciting progress that is underpinnings-why adhesives work, how they being made in the use of robotics to apply ad are selected, how the surface is prepared, how hesives, techniques already far advanced in au they are applied, how they

are set, how the tomotive assembly. cured joint is tested.
Cycloaddition Reactions of Heterocumulenes John Wiley & Sons
The use of hazardous chemicals such as methyl isocyanate can be a significant concern to the residents of communities adjacent to chemical facilities, but is often an integral part of the chemical manufacturing process. In order to ensure that chemical manufacturing takes place in a manner that is safe for workers, members of the local community, and the environment, the philosophy of inherently safer processing can be used to identify opportunities to eliminate or reduce the hazards associated with chemical processing. However, the concepts of inherently safer process analysis have not yet been adopted in all chemical manufacturing plants. The Use and Storage of Methyl Isocyanate (MIC) at Bayer CropScience presents a possible framework to help plant managers choose between alternative processing options-considering factors such as environmental impact and product yield as well as safety- to develop a chemical manufacturing system. In 2008, an explosion at the Bayer CropScience chemical production plant in Institute, West Virginia, resulted in the deaths of two employees, a fire within the production unit, and extensive damage to nearby structures. The accident drew renewed attention to the fact that the Bayer facility manufactured and stores methyl isocyanate, or MIC - a volatile, highly toxic chemical used in the production of carbamate pesticides and the agent responsible for thousands of death in Bhopal, India, in 1984. In the Institute accident, debris from the blast hit the shield surrounding a MIC storage tank, and although the container was not damaged, an investigation by the U.S. Chemical Safety and Hazard Investigation Board found that the debris could have struck a relief valve vent pipe and cause the release of MIC to the atmosphere. The Board's investigation also highlighted a number of weaknesses in the Bayer facility's emergency response systems. In light of these concerns, the Board requested the National Research Council convene a committee of independent experts to write a report that examines the use and storage of MIC at the Bayer facility. The Use and Storage of Methyl Isocyanate (MIC) at Bayer CropScience also evaluates the analyses on alternative production methods for MIC and carbamate pesticides preformed by Bayer and the previous owners of the facility.
The Chemistry of the Isocyanate Radical, with Reference to Its Application to Polymer Technology ScholarlyEditions
Cycloaddition Reactions of Heterocumulenes reviews cycloaddition reactions, particularly on hetercocumulenes having "four-electron" bonds. This book discusses the chemical relationship among the various classes of heterocumulenes, including their chemical reactivity which ranges from highly reactive species to nearly inert compounds. This text also investigates the nucleophilic reactions of ketenes and isocyanates with suitable substrates, and if possible, correlates available data with the reactivity of these species in cycloaddition reactions. This book also investigates the cycloaddition reactions of carbon suboxide and other aspects of its chemistry due to the presence of many other interrelated reactions. The synthetic organic chemist should also investigate the application of isocyanate reactions associated with the cumulative double bonds. This text investigates carbodiimides as useful reagents for peptide synthesis, and notes that the stability of carbodiimides increases significantly with sterical hindrance around the cumulative double bond system. This book discusses three compounds that have a central electrophilic carbon atom, namely, carbon dioxide, carbonyl sulfide, and carbon disulfide. The book also describes the cycloaddition reactions of sulfenes, of N-sulfinylamines, of N-sulfinylsulfonamides, and of sulfurdiimides. This book can prove useful for researchers, technicians, and scientists whose works involve organic chemistry, analytical chemistry, and other related fields of chemistry.
Chemistry of Organic Isocyanates Royal Society of Chemistry
"This book is about Polyurethane Chemistry: Renewable Polyols and Isocyanates"--
Investigation of the Radical Chemistry of Organic Isocyanates and Imines John Wiley & Sons
Describes the current status and potential of synthetic chemistry designed to use and to generate fewer hazardous substances. Examines new techniques for carrying out transformations in environmentally benign solvent systems. Presents research results on the replacement of hazardous feedstocks with biologically derived, innocuous feedstocks; of hazardous reagents with visible light; and of phosgene, benzene, and halogens in a variety of industrially important reactions. Provides examples of how alternative synthetic design for pollution prevention has been made commercially viable. Describes how to conduct a source-reduction assessment and analyzes computer-assisted synthetic design.
Advances in Chemistry of Nova Science Publishers
Volume 2 of the updated and extended 3rd edition of this work focuses on the chemistry and technology of rigid polyurethanes. Recent developments in obtaining polyols from renewable resources and the field of rigid polyurethanes have been included. This book is of interest to chemists and engineers in industry and academia as well as anyone working with polyols for the manufacture of PUs.
Chemistry and Technology of Polyols for Polyurethanes, 2nd Edition John Wiley & Sons
This first volume of the updated and extended 3rd edition of this work covers the basic chemistry and technology of oligo-polyol fabrication, the characteristics of the various oligo-polyol families and the effects of their structure on the properties of the resulting PU. This book is of interest to chemists and engineers in industry and academia as well as anyone working with polyols for the manufacture of PUs.
Polyurethanes Ellis Horwood
- MDI und TDI sind Diisocyanate, die industriell als Bausteine für Polymere verwendet werden, aber für die Gesundheit und die Umwelt nicht unbedenklich sind - erstmals werden hier Gesundheits- und Umweltrisiken von TDI und MDI gezielt in einem Band angesprochen - mit zahlreichen Photos, Spektren, Tabellen und Diagrammen - Beiträge von Experten aus Forschung, Industrie und Behörden
Benign by Design Walter de Gruyter GmbH & Co KG
A practical handbook rather than merely a chemistry reference, Szycher's Handbook of Polyurethanes, Second Edition offers an easy-to-follow compilation of crucial new information on polyurethane technology, which is irreplaceable in a wide range of applications. This new edition of a bestseller is an invaluable reference for technologists, marketers, suppliers, and academicians who require cutting-edge, commercially valuable data on the most advanced uses for polyurethane, one of the most important and complex specialty polymers. internationally recognized expert Dr. Michael Szycher updates his bestselling industry "bible" With seven entirely new chapters and five that are revised and updated, this book summarizes vital contents from U.S. patent literature—one of the most comprehensive sources of up-to-date technical information. These patents illustrate the most useful technology discovered by corporations, universities, and independent inventors. Because of the wealth of information they contain, this handbook features many full-text patents, which are carefully selected to best illustrate the complex principles involved in polyurethane chemistry and

technology. Features of this landmark reference include: Hundreds of practical formulations Discussion of the polyurethane history, key terms, and commercial importance An in-depth survey of patent literature Useful stoichiometric calculations The latest "green" chemistry applications A complete assessment of medical-grade polyurethane technology Not biased toward any one supplier’s expertise, this special reference uses a simplified language and layout and provides extensive study questions after each chapter. It presents rich technical and historical descriptions of all major polyurethanes and updated sections on medical and biological applications. These features help readers better understand developmental, chemical, application, and commercial aspects of the subject.

Physical Chemistry of Small Energetic Isocyanates John Wiley & Sons

Bioconjugate Techniques, 2nd Edition, is the essential guide to the modification and cross linking of biomolecules for use in research, diagnostics, and therapeutics. It provides highly detailed information on the chemistry, reagent systems, and practical applications for creating labeled or conjugate molecules. It also describes dozens of reactions with details on hundreds of commercially available reagents and the use of these reagents for modifying or cross linking peptides and proteins, sugars and polysaccharides, nucleic acids and oligonucleotides, lipids, and synthetic polymers. A one-stop source for proven methods and protocols for synthesizing bioconjugates in the lab Step-by-step presentation makes the book an ideal source for researchers who are less familiar with the synthesis of bioconjugates More than 600 figures that visually describe the complex reactions associated with the synthesis of bioconjugates Includes entirely new chapters on the latest areas in the field of bioconjugation as follows: Microparticles and nanoparticlesSilane coupling agentsDendrimers and dendronsChemoselective ligationQuantum dotsLanthanide chelatesCyanine dyesDiscrete PEG compoundsBuckyballs,fullerenes, and carbon nanotubesMass tags and isotope tagsBioconjugation in the study of protein interactions

The Interfacial Chemistry of Isocyanate CRC Press

The Chemistry and Physics of Coatings provides an introduction to the science underpinning the paint (organic coatings) industry to graduate level chemists who may have no previous knowledge of polymer-based technologies. This book stresses important physical phenomena such as rheology, film formation, and mechanical properties, their exploitation in paint, and the economic and legislative background against which coatings technology is tested. Attention is given to the chemistry of the polymers, pigments, and solvents that compose typical coatings, and the complex 'science and art' of formulating them effectively. The book also aims to give insights into the commercial application of the chemistries described, and includes a glossary of industry and polymer-related terms. Revised and updated, this second edition has been expanded to include separate chapters on binders for high solids and solvent-free coatings, inorganic and hybrid coatings and coatings formulation. There is also a new section on coatings additives. The Chemistry and Physics of Coatings will be of particular interest to graduates of materials and polymer sciences and related areas. It will also appeal to undergraduates, lecturers and those in the paint industry. Extracts from reviews of 1st Edition "... readable and surprisingly comprehensive ... In short this is an excellent book, which I recommend without hesitation." Journal of Materials Chemistry "..an informative and thoroughly recommended volume." Polymer International

Fire Toxicity National Academies Press

Polyurethanes are one of the most dynamic groups of polymers, they find use in nearly every aspect of modern life, in applications such as furniture, bedding, seating and instrument panels for cars, shoe soles, thermoinsulation, carpet backings, packaging, adhesives, sealants, binders and as coatings. In 2004 10.6 million tons of polyurethanes were produced, in 2014 the world production was close to 20 million tons. In the last decade (2005-2015) important, worldwide developments in the area of polyols for polyurethanes were carried out, especially for polyols from renewable resources, described in detail in this second edition of the book. The main raw materials used for the production of PU are polyols and isocyanates. The first of these is the subject of this two volume handbook. Volume 1 is dedicated to polyols for elastic PU (flexible foams, elastomers and so on). Volume 2 is dedicated to polyols for rigid PU (rigid foams, wood substitute, packaging, flotation materials and so on). The book considers the raw materials used to build the PU polymeric architecture. It covers the chemistry and technology of oligo-polyol fabrication, the characteristics of the various oligo-polyol families and the effects of the oligo-polyol structure on the properties of the resulting PU. It presents the details of oligo-polyol synthesis, and explains the chemical and physico-chemical subtleties of oligo-polyol fabrication. This book links data and information concerning the chemistry and technology of oligo-polyols for PU, providing a comprehensive overview of: Basic PU chemistry Key oligo-polyol characteristics Synthesis of the main oligo-polyol families, including: polyether polyols, filled polyether polyols, polyester polyols, polybutadiene polyols, acrylic polyols, polysiloxane polyols, aminic polyols Polyols from renewable resources Flame retardant polyols Chemical recovery of polyols Relationships between polyol structure and PU properties This book will be of interest to all specialists working with polyols for the manufacture of PU and to all researchers that would like to know more about polyol chemistry.

Handbook of Adhesives World Scientific

Polyurethanes (PUs) are an important class of thermoplastic and thermoset polymers obtained by polycondensation reactions among different polyols, isocyanates and chain extenders, leading to a wide variety of polymers with many different properties and applications. In this book, the authors present current research in the study of the properties, structure and applications of polyurethane. Topics include polyurethanes in analytical chemistry applications from sorbent foams to conductive materials and sensors; biomedical polyurethane-based materials and blocked polyurethanes in x-ray shielding and electrically conductive adhesives.

Szycher's Handbook of Polyurethanes, Second Edition ScholarlyEditions

This book review the synthetic approaches used for the synthesis of isocyanates and ureas. Ureas is a group of chemical compounds, structurally contain R'RN-CO-NRR' functional group consist of carbonyl group sandwiched between two moieties of organic amine. Allantoin, hydantoin and carbamide peroxide are a few examples of ureas compounds. The compounds of ureas are strongly related to biuret and on the basis of their structure they are highly correlated to amides, diimides, carbamates, thiocarbamides and carbiimides. The detailed discussion of synthesis of isocyanate and ureas with chemical structure and schemes enhance the understanding of reader. The book also highlights the biological importance of ureas and its derivatives. With detailed studies that not only illustrate the synthetic methodologies but also focus on the pharmacological and medicinal importance of nitrogen containing compounds, this book is a practical, hands-on reference for upper-level undergraduates and graduates students and researchers in the field of medicinal chemistry.

Isocyanates—Advances in Research and Application: 2012 Edition Smithers Rapra Technology
Polyurethanes are one of the most dynamic groups of polymers, they find use in nearly every aspect of modern life, in applications such as furniture, bedding, seating and instrument panels for cars, shoe soles, thermoinsulation, carpet backings, packaging, adhesives, sealants, binders and as coatings. In 2004 10.6 million tons of polyurethanes were produced, in 2014 the world production was close to 20 million tons. In the last decade (2005-2015) important, worldwide developments in the area of polyols for polyurethanes were carried out, especially for polyols from renewable resources, described in detail in this second edition of the book. The main raw materials used for the production of PU are polyols and isocyanates. The first of these is the subject of this two volume handbook. Volume 1 is dedicated to polyols for elastic PU (flexible foams, elastomers and so on). Volume 2 is dedicated to polyols for rigid PU (rigid foams, wood substitute, packaging, flotation materials and so on). The book considers the raw materials used to build the PU polymeric architecture. It covers the chemistry and technology of oligo-polyol fabrication, the characteristics of the various oligo-polyol families and the effects of the oligo-polyol structure on the properties of the resulting PU. It presents the details of oligo-polyol synthesis, and explains the chemical and physico-chemical subtleties of oligo-polyol fabrication. This book links data and information concerning the chemistry and technology of oligo-polyols for PU, providing a comprehensive overview of: Basic PU chemistry Key oligo-polyol characteristics Synthesis of the main oligo-polyol families, including: polyether polyols, filled polyether polyols, polyester polyols, polybutadiene polyols, acrylic polyols, polysiloxane polyols, aminic polyols Polyols from renewable resources Flame retardant polyols Chemical recovery of polyols Relationships between polyol structure and PU properties This book will be of interest to all specialists working with polyols for the manufacture of PU and to all researchers that would like to know more about polyol chemistry.
Bioconjugate Techniques ScholarlyEditions
Chemistry and Technology of Isocyanates is a comprehensive book on isocyanate chemistry and technology. It highlights the industrial applications of diisocyanates in the manufacture of flexible and rigid foams, elastomers, coatings and adhesives; discusses ionomers used in water-based coatings, polymer networks and biomedical polymers; and reviews current and future environmental issues, including toxicity and safe handling of isocyanates, recycling of isocyanate derived polymers and monomers derived from natural products.
Mihail Ionescu: Polyols for Polyurethanes. Volume 2 William Andrew

Isocyanates—Advances in Research and Application: 2012 Edition is a ScholarlyBrief™ that delivers timely, authoritative, comprehensive, and specialized information about Isocyanates in a concise format. The editors have built Isocyanates—Advances in Research and Application: 2012 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Isocyanates in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Isocyanates—Advances in Research and Application: 2012 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at http://www.ScholarlyEditions.com/.
Synthesis and Characterization of a Novel Blocked Isocyanate Dental Adhesive Based on Diphenylmethane - 4, 4' - Diisocyanate Wiley
A complete overview of a key plastic One of the most versatile polymer materials, polyurethanes have a unique chemical nature that allows for shaping and molding to fit all sorts of consumer and industrial products – seat cushions, carpets, insulation, coatings, and refrigerators to name a few. Despite its popular uses, polyurethane science has only relatively recently achieved appreciation for the richness of its expression as a polymer family. This book provides a thorough presentation of polyurethane science, technology markets and trend analysis based on recent patents. Although it does not provide ultimate detail (such as explicit information typically in patents), the book has a flow and continuity that allows readers to find all the background necessary to understand any other more detailed polyurethane information found elsewhere. Anyone involved in the polymer and plastics industry will find this book a key resource with features that include: An in-depth summary of the current state of polyurethane research and knowledge Discussion of the applications, manufacture, and markets for polyurethanes Analytical methods, reaction mechanisms, morphology, theoretical techniques, and the selection of chain extenders Polyurethane flexible and rigid foams, elastomers, coatings, adhesives, and medical applications In-depth coverage of governmental regulations, non-isocyanate/non-phosgene routes to polyurethane structure, and industrial routes to environmental, health, and safety risk mitigation
The Use and Storage of Methyl Isocyanate (MIC) at Bayer CropScience Elsevier
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