Biobased Materials For Polyurethane Dispersions

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Polyurethanes part 1 What are bio-based materials? Effects of Different Isocyanates on Polyurethanes **Bio based Urethane Infusion**

Dispersant Technology and Benefits Overview

Preparation of Polyurethane | Synthesis of Polyurethane (Conceptual) by Dr. K. Shirish

Kumar. Smart biobased materials Polyurethanes part 2

Troubleshooting Polyurethane Formulations **Chemicals \u0026 Materials for Emerging Technologies (CheMET) 2020 - Day 1** ~~RHOBARR™ Polyolefin Dispersion - A more sustainable, high performance coating~~

Nanomaterials Webinar : Nanostructured and Functional Templated Coatings

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Mixing Polyurethane Foam Liquid*Polyurethane Foam - How is it made? Epoxy vs Polyurethane Flooring: Understand the differences A Fresh Approach to Can Coating: CANVERA™ Polyolefin Dispersions Building a composite VRTM Mould-*

an overview ~~Raw Material □□ □□□□ □□ □□□□ □□□□ | Fancy Rubber EVA Sole Sheet Manufacturing Business ideas~~ *Isocyanate* **Polyurethane Foam** *Asphalt Seal Your Own Driveway!*

FULLY automatic A4 paper production line, cutting, ream packing, carton packing 20181026~~Aptalon™ M8100 – Polyamide Polyurethane Dispersion Technology~~ ~~Design and Synthesis of Waterborne Polyurethanes~~ **Safer Made: Investing in Safer Chemistry and Consumer Products Research Pays Off November 2017: Biopolymers in Asphalt Production** ~~Nanomaterials Webinar : Nanostructured Polymers and Nanomaterials for Oil \u0026 Gas~~

□50000WORDS-V10-L5-ALL□ Level-5□ 50000 English Words sorted by frequency, 50000□□□□□□**Webinar: La Microencapsulación del Futuro** **Materials Selection in Engineering Design** Biobased Materials For Polyurethane Dispersions

Bio -based polyurethane dispersions are attracti ng increased attention due to environmental concerns and the realization t hat global petroleum resources are finite, which not only can replace...

(PDF) Biobased materials for polyurethane dispersions.

(PDF) Biobased materials for polyurethane dispersions | Chemistry International - Academia.edu Nowadays, most of the commercially available resins are synthesized from petroleum based stocks. Besides exhibiting excellent properties, synthetic resins are coming under increasing restrictions due to tightening environmental exposure regulations,

(PDF) Biobased materials for polyurethane dispersions ...

Biobased materials for polyurethane

dispersions. Chemistry International 2(3) (2016) 158-167. INTRODUCTION Aqueous polyurethane (PU) dispersion is a binary colloidal system in which PU particles are dispersed in a continuous aqueous media (Mohaghegh et al., 2005). Most conventional PU dispersions are high molecular weight ionic polymers

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In this study, two different bio-based waterborne polyurethanes (WBPUs) that use castor oil and tartaric acid in their formulations were modified by the incorporation of a renewable reinforcement, cellulose nanocrystals (CNC), to be further applied as metal coatings of tailored properties.

Bio-based waterborne polyurethanes reinforced with ...

Bio-derived material, such as vegetable oils, cashew nut shell liquid (CNSL), terpene, Eucalyptus tar and other bio-renewable sources, constitute a rich source of precursors for the synthesis of polyols and isocynates which are being considered for the production of “greener” PU coatings.

Bio-based polyurethane: An efficient and environment ...

With the introduction of PDI in the market, it is now possible to commercially produce a 100% bio-based polyurethane. Bayer MaterialScience announced that it has developed a bio-based hardener for PU coatings and adhesives under the brand Desmodur® eco N 7300, which is based on PDI. These coatings can now be formulated entirely from bio-based materials using renewable-based polyols, cross-linkers and PDI.

100% bio-based Polyurethane in the market | Green ...

Waterborne bio-based polyurethane dispersion Impranil® eco We developed waterbased PU to eliminate solvents like DMF in textiles, decrease the water consumption by 95% & the energy consumption by 50% Through incorporating renewable materials we further increase the sustainability

Sustainable Polyurethanes from biobased chemicals

Aptalon™ 8080HS is a high solid, waterborne, one component, self-crosslinking polyamide polyol polyurethane dispersion with a high bio -based 1 content designed for clear wood finishes.

Bio-Based High Solids Waterborne Polyurethane Dispersion

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Bayer MaterialScience is introducing a range of waterborne, bio-based polyurethane dispersions under the Impranil® eco name. With a renewable content that reaches as high as 65 percent, this product class contributes to a further reduction of CO_2 emissions, thus further improving the sustainability of waterborne PU. The first products in the series were developed specially for use in fashion apparel, accessory and footwear applications.

Bayer MaterialScience increasingly using ... - Bio-based News

A report on ' Bio-Based Polyurethane Market' Added by Market Study Report, LLC, features the recent and upcoming growth trends of this business in addition to accurate details related to the myriad geographies that comprise the regional spectrum of the Bio-Based Polyurethane market.

Bio-Based Polyurethane Market Overview, Industry Top ...

Polyurethane Dispersion, or PUD, is

understood to be a polyurethane polymer resin dispersed in water, rather than a solvent. Its manufacture involves the synthesis of polyurethanes having carboxylic acid functionality or nonionic hydrophiles like PEG incorporated into, or pendant from, the polymer backbone.

Polyurethane dispersion - Wikipedia

The water-dispersible polyurethane polymer includes hydrophobic oligomeric polyether soft segments that include 1,2-di-substituted oxyethylene repeating units.

US8952093B2 - Bio-based polyurethane dispersion ...

2.2.3 Aqueous polyurethane dispersions 39 2.3 Isocyanate-free routes to bio-based polyurethanes 42 2.3.1 Through carbonate-amine reactions 42 2.3.2 Through transurethanization and self-condensation 44 2.4 Conclusions 46

Bio-based poly(urethane urea) dispersions : chemistry ...

DuPont Nutrition & Biosciences (Wilmington, Del.) and Kemira Oyj (Helsinki, Finland) announced an exclusive partnership for the development and commercialization of DuPont’s enzymatic polymerization-based polysaccharide platform technology for certain applications. The collaboration will bring new, biobased and inherently biodegradable product lines to Kemira’s strategic markets including ...

Polyurethane nanocomposites present an attractive and sustainable way for designing smart materials that can be used in packaging, health and energy applications. Biobased Smart Polyurethane Nanocomposites brings together the most recent research in the field from the basic concepts through to their applications. Special emphasis is given to sustainable biodegradable polyurethane nanocomposites with hyperbranched architecture. The book introduces biobased polyurethanes and the nanomaterials that can be used as nanocomposites followed by the resulting polyurethane nanocomposites. The second part then explores important applications in paints and surface coatings, shape memory, self-healing, self-cleaning, biomaterials and packaging materials. Written by a leading expert on polyurethane nanocomposites, the book is a great introduction to this smart material and its applications.

The book is a comprehensive treatment of the subject covering a wide range of subjects uniquely available in a single source for the first time. A material science approach has been adopted in dealing with wood adhesion and adhesives. The approach of the authors was to bring out hierarchical cellular and porous characteristics of wood with polymeric cell wall structure, along with the associated non-cell wall extractives, which greatly influence the interaction of wood substrate with polymeric adhesives in a very unique manner not existent in the case of other adherends. Environmental aspects, in particular formaldehyde emission from adhesive bonded wood products, has been included. A significant feature of the book is the inclusion of polymeric matrix materials for wood polymer composites.

Biopolymeric Nanomaterials: Fundamentals and Applications outlines the fundamental design concepts and emerging applications of biopolymeric nanomaterials. The book also provides information on emerging applications of biopolymeric nanomaterials, including in biomedicine, manufacturing and water purification, as well as assessing their physical, chemical and biological properties. This is an important reference source for materials scientists, engineers and biomedical scientists who are seeking to increase their understanding of how polymeric nanomaterials are being used for a range of biomedical and industrial applications. Biopolymeric nanomaterials refer to biocompatible nanomaterials, consisting of biopolymers, such as protein (silk, collagen, gelatin, ß-casein, zein, and albumin), protein-mimicked polypeptides and polysaccharides (chitosan, alginate, pullulan, starch, and heparin). Biopolymeric nanomaterials may be used as i) delivery systems for bioactive compounds in food application, (ii) for delivery of therapeutic molecules (drugs and genes), or for (iii) tissue engineering. Provides information on the design concepts and synthesis of biopolymeric nanomaterials in biomedical and industrial applications Highlights the major properties and processing methods for biopolymeric nanomaterials Assesses the major challenges of producing biopolymeric nanomaterials on an industrial scale

Handbook of Waterborne Coatings comprehensively reviews recent developments in the field of waterborne coatings. Crucial aspects associated with coating research are presented, with close attention paid to the essential aspects that are necessary to understand the properties of novel materials and their use in coating materials. The work introduces the reader to progress in the field, also outlining applications, methods and techniques of synthesis and characterization that are demonstrated throughout. In addition, insights into ongoing research, current trends and challenges are previewed. Topics chosen ensure that new scholars or advanced learners will find the book an essential resource. Serves as a reference guide to recent developments in waterborne coatings for industrialists, scientists and engineers involved in the field of coatings Presents coverage of the unique application methods for waterborne coatings and when those methods should be used Provides foundational information on waterborne coatings and discusses current market trends that impact the field

Biobased Products and Industries fills the gap between academia and industry by covering all the important aspects of biobased products and their relevant industries in one single reference. Highlighting different perspectives of the bioeconomy, EU relevant projects, as well as the environmental impact of biobased materials and sustainability, the book covers biobased polymers, plastics, nanocomposites, packaging materials, electric devices, biofuels, textiles, consumer goods, and biocatalysis for the decarboxylation and decarboxylation of biobased molecules, including biobased products from alternative sources (algae) and the biobased production of chemicals through metabolic engineering. Focusing on the most recent advances in the field, the book also analyzes the potentiality of already commercialized processes and products. Highlights the important aspects of biobased products as well as their relevant industries in one single reference Focuses on the most recent advances in the field, analyzing the potentiality of already commercialized processes and products Provides an ideal resource for anyone dealing with bioresource technology, biomass valorization and new products development

Polyurethanes are formed by reacting a polyol (an alcohol with more than two reactive hydroxyl groups per molecule) with a diisocyanate or a polymeric isocyanate in the presence of suitable catalysts and additives. Because a variety of diisocyanates and a wide range of polyols can be used to produce polyurethane, a broad spectrum of materials can be produced to meet the needs of specific applications. During World War II, a widespread use of polyurethanes was first seen, when they were used as a replacement for rubber, which at that time was expensive and hard to obtain. During the war, other applications were developed, largely involving coatings of different kinds, from airplane finishes to resistant clothing. Subsequent decades saw many further developments and today we are surrounded by polyurethane applications in every aspect of our everyday lives. While polyurethane is a product that most people are not overly familiar with, as it is generally "hidden" behind covers or surfaces made of other materials, it would be hard to imagine life without polyurethanes.

This book presents an overview of various types of lignin and their unique structures and properties, as well as utilizations of crude or modified technical lignin for high-value bioproducts such as lignin-based PF resins/adhesives, epoxy resins, PF foams, PU foams, rubber reinforcement and carbon fibers and as dispersants in drilling fluids in the oil and gas industry. It subsequently discusses various thermal/chemical modification techniques (pyrolysis, direct liquefaction and de-polymerization) for converting lignin into oils and chemical feedstocks, and the utilization of crude lignin, lignin-derived oils or depolymerized lignins (DLs) of reduced molecular weights and improved reactivity to produce lignin-based PF resins/adhesives, PF/PU foams and epoxy resins. The book will interest and benefit a broad readership (graduate students, academic researchers, industrial researchers and practitioners) in various fields of science and technology (chemical engineering, biotechnology, chemistry, material science, forestry, etc.). Chunbao (Charles) Xu, PhD, is currently a Professor of Chemical Engineering and NSERC/FPInnovations Industrial Research Chair in Forest Biorefinery at the University of Western Ontario, Canada. Fatemeh Ferdosian, PhD, is currently a postdoctoral fellow at the University of Waterloo, Canada.

The growing need to find a sustainable, environmentally-friendly replacement for petroleum-based materials is fuelling the development of bio-based polymers from renewable resources. Amongst the most promising of these are vegetable oil-based polymeric materials. Vegetable oil-based polymers provides a comprehensive review of the research in this important field. After an introduction to classification and polymerization, Vegetable oil-based polymers goes on to review the factors involved in polymer biodegradation. The extraction, purification and application of vegetable oils are then explored, along with vegetable oil-based polyesters and poly(ester amide)s, polyurethanes and epoxies. The book then reviews polyamides, polyolefins and vegetable oil-based hyperbranched polymers. It concludes with an analysis of vegetable oil-based polymer composites and polymer nanocomposites. Vegetable oil-based polymers is an indispensable guide for all those involved in the research and development of biopolymers as well as the wide range of industries looking for more sustainable polymer materials. Provides a comprehensive review of recent research in the area of vegetable oil-based polymeric materials Discusses vegetable oils and their derivatives, biodegradable polymers and the fundamentals of polymers Explores the extraction, purification and application of vegetable oils, along with vegetable oil-based polyesters and poly(ester amide)s, polyurethanes and epoxies

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.

In recent years, bio-based materials technology is developing rapidly. Bio-based materials especially vegetable oil-based materials are considered as the potential alternatives to conventional petroleum-based materials in the future. For example, vegetable oil derived polyols have been widely applied in coatings, plastic films, lubricants, rubbers, elastomers, and many other intermediate products. Although some of the petroleum-based products could be replaced by bio-based materials, many important petroleum-based materials have rarely suitable alternatives for the industrial application. Therefore, from a sustainable point, it is significant to continuously study the alternatives to petroleum-based materials for coating development.In this work, three projects of vegetable oil-based green organic coatings were investigated. In Chapter 3, a self-healing coating contained vegetable oil-based epoxy ester as the healing agent was designed to improve the self-healing function. In Chapter 4, a waterborne polyurethane coating with improved mechanical property and corrosion resistance was synthesized from vegetable oil-based isocyanate. In Chapters 5 to 7, the fundamental structure-property relationships for non-isocyanate polyurethane (NIPU) coatings synthesized through green approaches were studied.In Chapter 3, poly urea formaldehyde (PUF) microcapsules containing vegetable oil-based epoxy ester were successfully synthesized through in-situ polymerization. Self-healing coatings were prepared by embedding PUF epoxy ester microcapsules in the epoxy coatings. The scratched self-healing coating can provide good recovery of the corrosion resistance, compared with the neat epoxy coating. These findings demonstrated that the vegetable oil-based epoxy ester is applicable for anticorrosive smart self-healing coatings as a healing agent.In Chapter 4, the waterborne polyurethane coatings were synthesized from dimer fatty acid diisocyanate (DDI). Previous reports showed they were challenging for the inadequate mechanical property which is due to the high flexibility of a long fatty acid chain on DDI. This problem had been solved in this study by incorporating an alkoxysilane group into vegetable oil-based waterborne polyurethane coatings. This enhancement was mainly caused by the formation of a Si-O-Si network structure from the alkoxysilane group. Additionally, the alkoxysilane modified DDI based polyurethane dispersion showed outstanding corrosion resistance due to the formation of a Si-O-Si network structure. The significantly improved mechanical property and anticorrosion property extended the potential application of DDI based material in waterborne polyurethane coatings.In Chapter 5, green waterborne two components (2K) NIPU epoxy hybrid coatings were synthesized from renewable cyclic carbonate, fatty acid amine, amine-based internal dispersion agent, and waterborne epoxy chain extender. Then, the thermal and mechanical properties were studied. The synthesized waterborne 2K NIPU showed the excellent balance of the mechanical strength and elongation-at-break which revealed that the rigid NIPU could be tailored by introducing fatty acid amine as a soft segment. Furthermore, in Chapter 7, to develop a more effective method for the preparation of waterborne NIPU coatings, a series of the waterborne one component (1K) NIPU coatings were synthesized from the amine-based internal dispersion agent, fatty acid amine, bisphenol A diglycidyl ether (DGEBA) cyclic carbonate, and multiple epoxy resins including DGEBA, trimethylolpropane triglycidyl ether, and 4,4'-Methylenebis(N,N-diglycidylaniline). Besides, in Chapter 6, the NIPU tetraethyl orthosilicate (TEOS) hybrid coatings were successfully prepared from amine-terminated NIPU, bisphenol A (BPA) epoxy, and TEOS. The anti-corrosion performance of environmentally friendly NIPU coatings was significantly enhanced by the sol-gel chemistry of TEOS. The results revealed that the organic phase NIPU cannot provide enough compatibility for inorganic phase TEOS. Therefore, phase separation occurs at the interface between the aggregation phase and the continuous phase. As a result, incorporating TEOS into NIPU coating can be an effective approach to improve the anti-corrosion performance of

NIPU coating.In general, the successfully synthesized vegetable oil-based self-healing coating, waterborne polyurethane coating, waterborne 2K, and 1K NIPU epoxy hybrid coating are the green alternatives to conventional petroleum-based coatings. The green vegetable oil-based coatings with great performance would expand their potential industrial application and promote the replacement of petroleum materials by green materials.

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