

# ADVANCES IN POLYMER SCIENCE

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Volume Editor:  
A.-C. Albertsson

## Degradable Aliphatic Polyesters



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# Degradable Aliphatic Polyesters

**American Chemical Society. Meeting**



## **Degradable Aliphatic Polyesters:**

Degradable Aliphatic Polyesters A.-C. Albertsson,2014-03-12 A renewed interest in aliphatic polyesters has resulted in developing materials important in the biomedical and ecological fields Mainly materials such as PLA and PCL homopolymers have so far been used in most applications There are many other monomers which can be used Different molecular structures give a wider range of physical properties as well as the possibility of regulating the degradation rate By using different types of initiators and catalysts ring opening polymerization of lactones and lactides provides macromolecules with advanced molecular architectures In the future new degradable polymers should be able to participate in the metabolism of nature Some examples of novel polymers with inherent environmentally favorable properties such as renewability and degradability and a series of interesting monomers found in the metabolisms and cycles of nature are given Degradable

Aliphatic Polyesters A.-C. Albertsson,2003-07-03 A renewed interest in aliphatic polyesters has resulted in developing materials important in the biomedical and ecological fields Mainly materials such as PLA and PCL homopolymers have so far been used in most applications There are many other monomers which can be used Different molecular structures give a wider range of physical properties as well as the possibility of regulating the degradation rate By using different types of initiators and catalysts ring opening polymerization of lactones and lactides provides macromolecules with advanced molecular architectures In the future new degradable polymers should be able to participate in the metabolism of nature Some examples of novel polymers with inherent environmentally favorable properties such as renewability and degradability and a series of interesting monomers found in the metabolisms and cycles of nature are given *Synthesis of Degradable*

*Aliphatic Polyesters: Strategies to Tailor the Polymer Microstructure* Jenny Fagerland,2018 Biodegradable Polyesters Stoyko Fakirov,2015-03-04 Collating otherwise hard to get and recently acquired knowledge in one work this is a comprehensive reference on the synthesis properties characterization and applications of this eco friendly class of plastics A group of internationally renowned researchers offer their first hand experience and knowledge dealing exclusively with those biodegradable polyesters that have become increasingly important over the past two decades due to environmental concerns on the one hand and newly devised applications in the biomedical field on the other The result is an unparalleled overview for the industrial chemist and materials scientist as well as for developers and researchers in industry and academia alike

*Biodegradable Polyesters* Stoyko Fakirov,2015-04-06 Collating otherwise hard to get and recently acquired knowledge in one work this is a comprehensive reference on the synthesis properties characterization and applications of this eco friendly class of plastics A group of internationally renowned researchers offer their first hand experience and knowledge dealing exclusively with those biodegradable polyesters that have become increasingly important over the past two decades due to environmental concerns on the one hand and newly devised applications in the biomedical field on the other The result is an unparalleled overview for the industrial chemist and materials scientist as well as for developers and researchers in industry

and academia alike *Handbook of Biopolymers and Biodegradable Plastics* Sina Ebnesajjad,2012-09-19 This new Handbook provides engineers and scientists with the information and practical guidance needed to successfully design and manufacture products using biopolymers and biodegradable plastics Biopolymers and biodegradable plastics are a hot issue across the plastics industry and for many of the industry sectors that use plastic from packaging to medical devices and from the construction industry to the automotive sector This book brings together in one place a number of key biopolymer and biodegradable plastics topics in chapters previously published as well as updated and new chapters for a broad audience of engineers of and scientists especially those designing with biopolymers and biodegradable plastics or evaluating the options for switching from traditional plastics to biopolymers Topics covered include preparation fabrication applications and recycling including biodegradability and compostability Applications in key areas such as films coatings controlled release and tissue engineering are discussed **Handbook of Biodegradable Polymers** Catia Bastioli,2020-03-09 This handbook covers characteristics processability and application areas of biodegradable polymers with key polymer family groups discussed It explores the role of biodegradable polymers in different waste management practices including anaerobic digestion and considers topics such as the different types of biorefineries for renewable monomers used in producing the building blocks for biodegradable polymers *Handbook of Polyester Drug Delivery Systems* M. N. V. Ravi Kumar,2017-03-27 In the quest for innovative drug delivery systems attempting to meet the unmet needs in pharmaceutical space research has taken a much more complicated path that poses a significant challenge for translation Despite the progress made with novel materials polyesters still remain at the helm of drug delivery technologies This book provides a single source of reference of polyester drug delivery systems that covers a broad spectrum of materials design manufacturing techniques and applications *Science and Principles of Biodegradable and Bioresorbable Medical Polymers* Xiang Cheng Zhang,2016-09-22 *Science and Principles of Biodegradable and Bioresorbable Medical Polymers* Materials and Properties provides a practical guide to the use of biodegradable and bioresorbable polymers for study research and applications within medicine Fundamentals of the basic principles and science behind the use of biodegradable polymers in advanced research and in medical and pharmaceutical applications are presented as are important new concepts and principles covering materials properties and computer modeling providing the reader with useful tools that will aid their own research product design and development Supported by practical application examples the scope and contents of the book provide researchers with an important reference and knowledge based educational and training aid on the basics and fundamentals of these important medical polymers Provides a practical guide to the fundamentals synthesis and processing of bioresorbable polymers in medicine Contains comprehensive coverage of material properties including unique insights into modeling degradation Written by an eclectic mix of international authors with experience in academia and industry **Biopolymers: Reuse, Recycling, and Disposal** Michael Niaounakis,2013-06-20 *Biopolymers Reuse Recycling and Disposal* is the first

book covering all aspects of biopolymer waste management and post usage scenarios embracing existing technologies applications and the behavior of biopolymers in various waste streams The book investigates the benefits and weaknesses social economic and environmental impacts and regulatory aspects of each technology It covers different types of recycling and degradation as well as life cycle analysis all supported by case studies literature references and detailed information about global patents Patents in particular comprising 80% of published technical literature in this emerging field widely scattered and often available in Japanese only are a key source of information Dr Niaounakis draws on disciplines such as polymer science management biology and microbiology organic chemistry environmental chemistry and patent law to produce a reference guide for engineers scientists and other professionals involved in the development and production of biopolymers waste management and recycling This information is also valuable for regulators patent attorneys and academics working in this field Explores techniques and technologies involved in managing biopolymers in the waste stream including recycling and upcycling Provides waste management and recycling professionals the knowledge they need to plan for the exponential growth in biopolymer waste Helps engineers and product designers fully consider the end of life aspects of their environmentally sustainable green products and solutions

Sustainable Biomaterials for Food Packaging Sneh Punia Bangar, Kyle D. Dunno, William Scott Whiteside, 2026-01-23 Considering the great demand for environmentally friendly packaging systems researchers are developing solutions that consider the sustainability and economic feasibility of the process Sustainable Biomaterials for Food Packaging evaluates the role of emerging biomaterials for food packaging systems and discusses in detail the various engineering aspects associated with packaging The book also covers the environmental aspects social perception and acceptance of biomaterials packaging It covers the sustainable packaging systems available for the preservation of all types of foods and products derived from meat milk fruits vegetables and baked goods The book is suited for academicians scientists students and food industry professionals it will also satisfy the needs of researchers scholars and students at both the postgraduate and undergraduate levels

Compostable Polymer Materials Ewa Rudnik, 2010-07-07 Compostable Polymer Materials deals with an environmentally important family of polymers designed to be disposed of in industrial and municipal compost facilities after their useful life These compostable plastics undergo degradation and leave no visible distinguishable or toxic residue Environmental concerns and legislative measures taken in different regions of the world make composting an increasingly attractive route for the disposal of redundant polymers This book provides up to date results and information about compostable polymer materials in a coherent and comprehensive manner It covers the entire spectrum of preparation properties degradation and environmental issues The emphasis is on recent studies concerning compostability and ecotoxicological assessment of polymer materials important issues from the ecological point of view Moreover the thermal behavior of compostable polymers is described Their price evolution over the past decade an estimation of the market and future perspectives are presented Focus on the composting process

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**Degradable Polymers and Materials** Kishan C. Khemani, Carmen Scholz, 2006 This book is an excellent guide to biobased and biodegradable polymeric materials It summarizes current knowledge on polymer degradation mechanisms and provides insight into recent state of the art syntheses of bio degradable polymers The book captures the shift that is currently observed in polymer industries which takes the industry from a strict petroleum based business to an industry that starts to incorporate biobased raw materials and seeks actively to manufacture materials that are environmentally benign The book describes various aspects of current polymer research with special emphasis on natural polymers syntheses and modifications of polyesters and characterization technologies that allow to elucidate degradation mechanisms The understanding of polymer degradation is not limited anymore to hydrolytic processes this book captures new approaches to the degradation of plastic materials ranging from photodegradation to the regulation of genes of polymer degrading microorganisms A profound part of the book is dedicated to poly lactic acid a polymer that is now produced in large scale from renewable resources the modification copolymerization application and engineering of this material is discussed in detail and a comprehensive review is provided

**Progress in Polymer and Rubber Technology** Dzaraini Kamarun, Siti Norasmah Surip, Noor Najmi Bonnia, Rozana Mohd Dahan, Famiza Abd Latiff, Azemi Samsuri, 2013-09-10 Selected peer reviewed papers from the International Polymer Technology Conference and Exhibition 2013 IPTCE 13 April 16 18 2013 Selangor Malaysia [Clickable Degradable Aliphatic Polyesters and Their Application as Nanoparticles for Imaging and Targeted Cellular Uptake](#) Nele S. Teske, 2014

[Biopolymers, Polyesters III - Applications and Commercial Products](#) A. Steinbüchel, 2001 Volumes 3a b and 4 focus on polyesters synthesized by bacteria and eukaryotic organisms as well as all aspects of the biosynthesis and metabolism of these biopolymers together with their production and isolation In addition these volumes treat various synthetic polyesters and related polymers synthesized by the chemical industry for the manufacture of biodegradable materials Topics include polyhydroxyalkanoates pha granules non storage phas poly malic acid cutin suberin polyphosphate polylactides polyglycolide polyanhydrides polyesteramides aliphatic organic polyesters and related polymers in vitro synthesis of polyesters chemical synthesis biotechnological production by fermentation isolation from plants production in transgenic plants biodegradation

**Kirk-Othmer Encyclopedia of Chemical Technology, Pigments to Powders, Handling** Kirk-Othmer, 1996-07-08  
**Macromolecular Synthesis of Functional Degradable Aliphatic Polyesters and Porous Scaffold Design**, 2011  
**Handbook of Pharmaceutical Excipients** Arthur H. Kibbe, 2000 Describes the chemical and physical properties of

pharmaceutical excipients Each monograph contains nonproprietary names synonyms chemical name and CAS registry number empirical formula and molecular weight structural formula functional category applications in pharmaceutical formulation or technology description pharmacopeial specifications typical properties stability and storage conditions incompatibilities method of manufacture safety handling precautions regulatory status pharmacopeias related substances comments specific references general references and authors

**Polymer Degradation and Performance** American Chemical Society. Meeting, 2009 This book focuses on the current scientific trends in polymer material property optimization and degradation with an emphasis on lifetime prediction and reliability and new avenues for the design of materials and bio polymers with improved performance

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