networks. The contents also cover the chemical aspects, physical structure and properties, life cycle assessment, and recycling possibilities as well as such unique "smart" properties like the shape memory effect of the three classes of thermoplastic elastomers. Homo-Copolymerization Studies Using Bimetallic/organometallic Catalysts Jennifer Lynn Mariejewska Patrak 1999 Handbook of Thermoplastic Polymers Stoyan Fakirov 2002 Handbook of Industrial Polyethylene and Technology Mark A. Spadling 2017-10-26 This handbook provides an exhaustive description of polyethylene. The 50+ chapters are written by some of the most experienced and prominent authors in the field, providing a truly unique view of polyethylene. The book starts with a historical discussion on how low density polyethylene was discovered and how it provided unique opportunities in the early days. New catalysts are presented and show how they created an explosion in available products including linear low density polyethylene, high density polyethylene, copolymer, and polyethylene produced from metallocene catalysts. With these different catalyst systems a wide range of structures are possible with an equally wide range of physical properties. Numerous types of additives are presented that include additifs for the protection of the resin from the environment and processing, fillers, processing aids, anti-fogging agents, pigments, and flame retardants. Common processing methods including extrusion, blown film, cast film, injection molding, and thermoforming are presented along with some of the more specialized processing techniques such as rotational molding, fiber processing, pipe extrusion, reactive extrusion, wire and cable, and foaming processes. The business of polyethylene including markets, world capacity, and future prospects are detailed. This handbook provides the most current and complete technology assessments and business practices for polyethylene resins. Handbook of Polymer Modification Andrey Lendlein 2011-08-15 A comprehensive overview of biodegradable polymers, covering everything from synthesis, characterization, and degradation mechanisms while also introducing useful applications, such as drug delivery systems and biomaterial-based regenerative therapies. An introductory section deals with such fundamentals as basic chemical reactions during degradation, the complexity of biological environments and experimental methods for monitoring degradation processes. The result is a reliable reference source for those wanting to learn more about this important class of polymer materials, as well as scientists in the field seeking a deeper insight. Product/package Interaction Mark David Newsham 1998 Functional Polymers in Food Science Giuseppe Ciritto 2011-03-10 Polymers are an important part in everyday life; products made from polymers range from sophisticated articles, such as biomaterials, to aerospace materials. One of the reasons for the great popularity exhibited by polymers is their ease of processing. Polymer properties can be tailored to meet specific needs by varying the "atomic composition" of the repeat structure, by varying molecular weight and by the incorporation (via covalent and non-covalent interactions) of an enormous range of compounds to impart specific activities. In food science, the use of polymeric materials is widely explored, from both an engineering and a nutraceutical point of view. Regarding the engineering application, researchers have discovered the most suitable materials for intelligent packaging preserving the food quality and prolonging the shelf-life of the food. Furthermore, in agriculture, specific functionalized polymers are used to increase the efficiency of treatments and reduce the environmental pollution. In the nutraceutical field, because consumers are increasingly conscious of the relationship between diet and health, the consumption of high quality foods is growing continuously. Different compounds (e.g. high quality proteins, lipids and polysaccharides) are well known to contribute to the enhancement of human health by different mechanisms, reducing the risk of cardiovascular disease, coronary disease, and hypertension. This first volume, of this two volume book, concerns the application of polymers in food packaging. Handbook of Polymer Blends and Composites A. K. Kuivila/hethe 2001 Polyolefins: 50 years after Ziegler and Natta Walter Kaminsky 2013-11-29 Advances in Polymer Science enjoys a longstanding tradition and good reputation in its community. Each volume is dedicated to a current topic, and each review critically surveys one aspect of that topic, to place it within the context of the volume. The volumes typically summarize the significant developments of the last 5 to 10 years and discuss them critically, presenting selected examples, explaining and illustrating the important principles, and bringing together many important references of primary literature. On that basis, future research directions in the area can be discussed. Advances in Polymer Science volumes thus are important references for every polymer scientist, as well as for other scientists interested in polymer science - as an introduction to a neighboring field, or as a comprehensive detailed information for the specialist. Polymer Melt Fracture Rudy Koopmans 2010-08-03 The continually growing plastics market consists of more than 250 million tons of product annually, making the recurring problem of polymer melt fracture an acute issue in the extrusion of these materials. Presenting a pictorial library of the different forms of melt fracture and real industrial extrusion melt fracture phenomena, Polymer Melt Fracture provides pragmatic identification and industrial extrusion defect remediation strategies based on detailed experimental and theoretical findings from the last 50 years. Distinct microscopic photos each chapter in this comprehensive volume covers a different aspect of the science and technology relating to polymer melt fracture. The book begins with a collection of optical and scanning electron microscopy pictures. These photos show distorted objects and structures for a number of commercially available polymers. The authors present a brief introduction to the basic science and technology of polymers. They explain what polymers are, how they are made, and how they can be used. They also discuss polymer characterization, review the principles of continuum mechanics, and define linear viscoelastic material functions. Techniques for observing and measuring fracture Next, the book explains how polymer melt fracture is actually experienced in the polymer processing industry. It explains the various ways polymer melt fracture may appear during polymer melt processing in different extrusion processes. The authors provide comprehensive reviews of the polymer melt fracture literature, with chapters on experimental findings and the techniques used to observe and measure polymer melt fracture, and the influence of polymer architecture and polymer processing conditions on the onset and types of polymer melt fracture. Posing a hypothesis about the phenomenon, the book presents the current understanding of polymer melt fracture. Mathematical equations recognizing the importance of models for simulations that may indicate potential solutions, the book discusses aspects of non-linear constitutive equations and microscopic theory and develops a macroscopic model, explaining the capabilities and limitations of this approach. The book presents an overview of pragmatic tools and methods that have been used to prevent the appearance of polymer melt fracture and explains how to use them to suppress polymer melt fracture. Handbook of Polymer Synthesis, Characterization, and Processing Enrique Saldívar-Guerra 2013-02-28 Covering a broad range of polymer science topics, Handbook of Polymer Synthesis, Characterization, and Processing provides polymer industry professionals and researchers in polymer science and technology with a single, comprehensive handbook summarizing all aspects involved in the polymer production process. The handbook focuses on industry important polymers, analytical techniques, and formulation methods, with chapters covering step-growth, radical, and co-polymerization, crosslinking and grafting, reaction engineering, advanced technology applications, including conjugated, dendritic, and nanomaterial polymers and emulsions, and characterization methods, including spectroscopy, light scattering, and microscopy. Introduction to Polymer-Clay Nanocomposites Ahmed Gures 2015-07-29 This book focuses on polymer-clay nanocomposite materials. It introduces readers to polymers, clays, and organo-clay and discusses the nature of interparticle interactions and physical adsorption, which are predominant in the synthesis of organo-clay; conversion of clay to organo-clay; interactions between functional groups in the interlayer region of clay and modifier ions; synthesis of organo-clays and their uses; and the commercial utilization of organo-clays. The text then covers the preparation of polymer-clay nanocomposites and their characterization, properties, performance, and applications. The primary goal of this book is to aid readers who wish to engage in the research and development of polymer-clay nanocomposites and to offer them an overview of the commonly used polymer-clay nanocomposites and their origins, manufacture, properties, and potential applications. This book will serve as a general introduction to researchers just entering the field and as a useful reference for scholars from other subfields. Handbook of Industrial Polyethylene and Technology Mark A. Spadling 2017-10-12 This handbook provides an exhaustive description of polyethylene. The 50+ chapters are written by some of the most experienced and prominent authors in the field, providing a truly unique view of polyethylene. The book starts with a historical discussion on how low density polyethylene was discovered and how it provided unique opportunities in the early days. New catalysts are presented and show how they created an expansion in available products including linear low density polyethylene, high density polyethylene, copolymer, and polyethylene produced from metallocene catalysts. With these different catalyst systems a wide range of structures are possible with an equally wide range of physical properties. Numerous types of additives are presented that include additives for the protection of the resin from the environment and processing, fillers, processing aids, anti-fogging agents, pigments, and flame retardants. Common processing methods including extrusion, blown film, cast film, injection molding, and thermoforming are presented along with some of the more specialized processing techniques such as rotational molding, fiber processing, pipe extrusion, reactive extrusion, wire and cable, and foaming processes. The business of polyethylene including markets, world capacity, and future prospects are detailed. This handbook provides the most current and complete technology assessments and business practices for polyethylene resins. Practical Guide to Polyethylene Cornelia Vasile 2005 This practical guide begins with general background to the polyethylene family, with price, production and market share information. It describes the basic types of polyethylene including virgin and filled polyethylene, copolymers, block and graft polymers and composites, and reviews the types of additives used in polyethylene. It gives the low down on the properties, including, amongst others, rheological, mechanical, chemical, thermal, and electrical properties. It goes on to describe the processing issues and conditions for the wide range of techniques used for polyethylene, and also considers post-processing and assembly issues. It offers guidance on product design and development issues, including materials selection. It is an indispensable resource for everyone working with this material. Handbook of Thermoplastics Olugbade Oladélé 2007-03-19 Covers a broad range of polymer science topics, Handbook of Thermoplastics provides a comprehensive coverage of all known commodity, engineering and specialty thermoplastics. It offers coverage of all known commodity, engineering and specialty thermoplastics. It includes new material on the structure, morphology and properties of polyolefin (PO) synthesis. It focuses on synthetic advances, the use of nano-clay in PO based composites and fibres, and the more recent technical developments. It also addresses the problem of interfacial and superficial phenomena. Handbook of Engineering Polymeric Materials P. Cheremisinoff 1997-01-25 Featuring practical information on new and conventional polymers and products as alternative materials and end-use applications, this work details technological advancements in high-strength plastics and elastomers, functionalized materials, and their product applications. The book also provides a companion handbook on manufacturing and processing techni