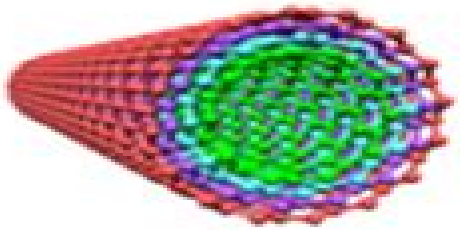
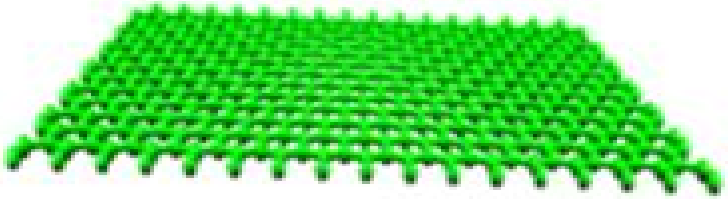
Carbon nanomaterials





Carbon Nanotube

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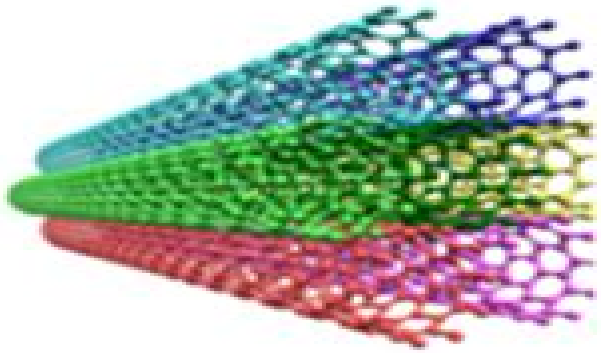

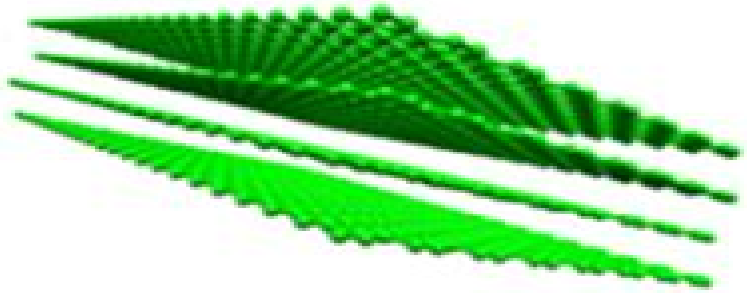

Agglomeration

π-π Stacking

Polymeric Composites New Concepts In Polymer Science Ser

Alexander Kovarski

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Polymeric Composites Raymond Benedict Seymour,1990-12 Part of the new concepts in Polymer science series an overview of Polymeric Composites by an author who is part of the Department of Polymer Science at the University of Southern Mississippi *Polymers and Polymeric Composites* Liliya I. Bazylak,Gennady E. Zaikov,A. K. Haghi,2014-12-15 This volume highlights the latest developments and trends in advanced polyblends and their structures It presents the developments of advanced polyblends and respective tools to characterize and predict the material properties and behavior The book provides important original and theoretical experimental results that use non routine methodologies **Polymers and Polymeric Materials for Fiber and Gradient Optics** Lekishvili,Nadareishvili,Gennady Zaikov,Khananashvili,2023-01-06 This book considers general aspects of the theory of polymers applied in optics The main factors affecting the light loss in polymeric wave beam guides PG are discussed and the mechanism of light loss in PG is analysed Polymers applied in fiber optics are classified with reference to methods of fabrication and purification of the materials Technological aspects of material fabrication are considered together with kinetic aspects of polymerisation Updated information on polymerisation kinetics of MMA and styrene and copolymerisation of these monomers with each other is reported Other topics discussed in the book are heterogeneity of optic copolymers association between structure and reactivity of monomers other properties of optic copolymers and areas of their commercial application This volume will be of value and interest to anyone working in the field of optic polymers both in academia and industry Immobilization on Polymers M.I. Shtilman,2023-01-06 This volume is devoted to the developments in the branch of polymer chemistry which deals with immobilized systems These systems are widely used in fields connected with metabolism in humans animals plants and micro organisms The study of these artificial immobilized systems permits the understanding and design of the function and behaviour of natural substances in living organisms The book contains the latest achievements in the field of synthesis of polymeric derivatives of different natural substances such as proteins peptides amino acids poly and monosaccharides nucleic acids nucleosides nucleotides coenzymes vitamines alkaloids antibiotics steroids hormones and others Special attention is given to natural and synthetic carriers and the influence of their chemical structure on the efficiency of systems obtained This work should be of value and interest to researchers in the field of polymer chemistry biotechnology and genetic engineering medical chemistry bio organic chemistry and enzymology **Polymeric Biomaterials** M. I. Shtilman,2003-07-28 Polymers and polymer based composites possess a wide spectrum of properties which allow them to be used in a diverse range of medical applications This volume in the book series New Concepts in Polymer Science deals with the application features of polymeric implants their interaction with surrounding living tissues the demands imposed upon the objects implanted and polymeric materials used for their manufacture and the main types of polymers applied and their properties Chapters 1 8 are devoted to various polymer applications in medical and biological fields chapters 9 10 consider

individual polymeric materials used in this field This monograph is designed for use as a textbook for specializations in chemical and technological courses in universities as well as a methodical manual and directory for scientists and researchers in both academia and industry Molecular Dynamics of Additives in Polymers Alexander Kovarski,2023-01-27 This volume focuses on the dynamical behaviour of low molecular additives in solid polymer matrixes It covers types and models of molecular motion in condensed media dependence of motional frequency on particle structure and size temperature volume and stress and polymer properties and polymeric structures Extensive analysis of common regularities of rotational and translational dynamics of molecules introduced into polymers are given The book also includes experimental techniques for molecular mobility evaluation and features detailed data on rotational dynamics of additives It should be of interest to specialists in various fields of polymer physical chemistry and materials science **Structure and Properties of Conducting Polymer Composites** V.E. Gul,2023-01-06 The development of the principles of electrically conductive polymer composites and the creation of a wide variety of such materials have had a significant influence on modern technology This volume in the New Concepts in Polymer Science series is devoted to various aspects of the structure and properties of electrically conductive polymer composites This monograph is an attempt to systematize modern ideas on the interconnection of the structure and properties of ECPCs Specific attention is given to the influence of electric current on kinetics and the direction of chemical interactive processes between such systems and air oxygen The book also contains a special chapter which is devoted to the practical applications of electrically conductive polymer composites It should be of use and interest to researchers working in the field **Radiation Chemistry of Polymers** V.S. Ivanov,2023-03-08 Part of the series New Concepts in Polymer Science this volume contains information on the main theoretical and practical problems involved in radiation chemistry of polymers The processes of polymerization and modification of polymers by grafting crosslinking and degradation induced by ionizing radiation are all described as well as the radiation resistance of polymers and their protection from radiation The book also contains applications of radiation chemistry of polymers such as principles of selection of radiation chemical processes for industrial use choice of radiation sources for specific processes modification of textile and film materials by grafting manufacturing of heat shrinkable thermostable and mechanically strong polymer products composites rubber vulcanizates and self adhesive products paints and coatings man made fibres materials for microelectronics and polymer materials for medical purposes Polymers Derived from Isobutylene. Synthesis, Properties, Application Yu.A. Sangalov,K.S. Minsker,G.E. Zaikov,2023-03-08 This monograph aims to give an overview of recent chemical and technological developments in the area of polymers and co polymers derived from isobutylene which have a wide range of industrial applications The scientific basis for presenting the material aEURO application of the acid base theory with a view to the fundamental steps of isobutylene polymerization aEURO is combined with the application of quantum chemical calculations of catalysts linked active centers separate elementary stages of the process and critical analysis of some

experimental data In addition a number of problems such as the macrokinetic description of isobutylene polymerization description of the balanced scheme of industrial production of isobutylene polymers and initiation of isobutylene polymerization with the help of immobilized cationic catalysts are discussed Special attention is given to ecological aspects of synthesis and application of isobutylene polymers This book will be of value and interest to researchers in the areas of chemistry and physics of high molecular compounds as well as engineers and technologists specialized in the area of olefins and polyolefins Interactions of Polymers with Bioactive and Corrosive Media A.L. Lordanskii,Gennady Zaikov,T.E. Rudakova,2023-01-27 Natural polymers have always been used in medicine However the development of synthetic polymers for use in medicine has occurred only in the last few decades The successful applications of these synthetic polymers in medicine depend mainly on their physico chemical and special characteristics such as biological compatibility with tissues stability durability and elasticity This book deals mainly with the kinetic and structural aspects which are essential for the realization of these characteristics The authors have examined in detail the processes of diffusion chemical and biological diintegration changes in various structural levels induced by chemical and biological media and the problems of simultaneous influence of these media and mechanical strains on polymers used in medicine Researchers in the field of polymer physics and chemistry as well as those who are working with applications of polymers in medicine and biology should find this book useful *High-Performance Polymers for Engineering-Based Composites* Omari V. Mukbaniani,Marc J. M. Abadie,Tamara Tatrishvili,2015-12-23 High Performance Polymers for Engineering Based Composites presents a selection of investigations and innovative research in polymer chemistry and advanced materials The book includes case studies in the field of nanocomposites The volume provides coverage of new research in polymer science and engineering with applications in chemical engineerin *Multiphase Biomedical Materials* T. Tsuruta,A. Nakajima,2021-12-24 Following many reports that were published in the last two decades on correlations of multiphase structures of the surface of materials with their antithrombogenicity or biocompatibility a research project Design of Multiphase Biomedical Materials was carried out in Japan between 1982 and 1986 The objective of this research project was to elucidate various aspects of biomedical behaviour of multiphase systems at the interface with living bodies at the molecular cellular and tissue levels Multiphase materials studied cover polymers having microphase separated structures hydrogels immobilized enzymes or cells ceramics and metallic materials The research project was carried out by the following subgroups Multiphase biomedical materials with microdomain structures Multiphase biomedical materials containing liquid components Hybrid type multiphase biomedical materials with biological components Inorganic and metallic multiphase biomedical materials Methods for analysis and evaluation of multiphase biomedical materials This book contains the results of the research project in an edited form and aims to provoke a better understanding about various aspects of cell material interactions in which the multiphase systems play a crucial role **Fire Resistant and Thermally Stable Materials Derived from Chlorinated Polyethylene**

Gennady Zaikov,A.A. Donskoi,M.A. Shashkina,2023-01-06 This new volume in the book series New Concepts in Polymer Science focuses on the problem of creating materials with reduced combustibility as well as the use of polymeric materials for protection from fire or overheating The majority of polymeric materials are combustible which has led to the development of polymers and materials based on these with reduced combustibility However the combustibility degree or their ability to protect from fire or high temperature can be indicated only in particular cases of combustion In this volume the results of the development of physicochemical bases for creating organic polymeric materials with reduced combustibility which are capable of protecting against high temperatures are discussed A presentation of chlorinated polyolefins as organic polymers with reduced combustibility is also given **Thermal Oxidation of Polymer Blends** Lyudmila Shibryaeva,Anatoly Popov,Gennady Zaikov,2006-06-08 To identify the specific features of the kinetics of oxidation of polymer mixtures determine the key structural elements and create a model that can describe the mechanism of thermal oxidation of polymer mixtures it is necessary to determine the relation between the initial structure of a polymer mixture structural rearrangements associated with oxidation and the kinetics of the process The aim of this book is to elucidate the complicated problem concerning the connection between the structure and mechanism of oxidation of heterogeneous and heterophase polymer systems The material presented in this book concerns the specific features of the kinetics of oxidation and those of the structure of polymer systems The book deals with an analysis of the key factors that can affect principally the mechanism of thermal oxidation of polymer mixtures determines the role of the phase morphology structure of components and the interface layer or boundary in the kinetics of oxidation of heterophase system by an example of mixtures of polyolefines Along with the kinetics of oxidation of heterophase systems problems of investigation of their structural parameters in the oxidized state are considered With this aim the material presented in the book concerns not only the mechanism of oxidation of polymer mixtures but also homopolymers of diverse morphology and model systems Textbook of Polymer Science Fred W. Billmeyer,1984-03-21 This Third Edition of the classic best selling polymer science textbook surveys theory and practice of all major phases of polymer science engineering and technology including polymerization solution theory fractionation and molecular weight measurement solid state properties structure property relationships and the preparation fabrication and properties of commercially important plastics fibers and elastomers **Ecological Aspects of Polymer Flame Retardancy** Gennady Zaikov,Lomakin,2014-07-30 This book deals with the ecological aspects of polymer flame retardation It deals with methods for estimating polymer flammability the mode of action of modern flame retardants and ecological concerns of the most used halogenated flame retardants **The Mesophase Concept in Composites** Pericles S. Theocaris,2012-12-06 The increasing use of advanced composite materials in modem structures of high performance calls for a detailed knowledge of their properties On the other hand these materials possessing intense anisotropy and in some cases non homogeneity require complicated theories based on homogeneous anisotropic elasticity Typically such materials either

involve fiber reinforced composites which are stacked in layers and form laminates or particulate composites containing a second phase in powder form However each case must be separately analyzed in terms of the particular characteristics of the materials involved and the process of preparation of the com posite systems Composite materials consisting of more than one destinct phase are in general use in modem industrial applications Machine parts structural components and others may be manufactured from such materials Epoxy resins are suitable matrices for this class of materials This is due not only to their general properties such as linear mechanical behavior transparency etc but also to the possibility of modifying their mechanical and optical properties in a very wide range by using suitable modifiers Their rheological behavior as well as their dynamic properties have been extensively investigated **Modern Polymer Flame Retardancy** Lomakin,Gennady Zaikov,2023-01-06 There are obvious benefits in using flame retardants as many human lives and property are saved from fire A large number of compounds have been identified as being used as flame retardants At present knowledge of long term effects resulting from exposure to flame retardants and their breakdown products is limited The aim of this volume in the book series New Concepts in Polymer Science is to provide a general overview of the nature mechanism of action use and environmental hazards for a number of flame retardants This monograph together with the book by the same authors Ecological Aspects of Polymer Flame Retardancy 1999 will valuable to anyone interested in the field of flame retardant chemicals **Biocide Guanidine Containing Polymers:** Sivov,2006-03-23 This volume deals with chemistry of polyelectrolytes namely biocide guanidine containing polymers discussing both synthesis of new guanidine containing monomers of diallyl and acrylic nature and their structure and investigation of their radical co polymerization and properties of new co polymers The first parts of the book describe radical polymerization of these monomers and their co polymerization with diallyldialkylammonium derivatives features of their kinetic behavior in these processes for example polymerization rates reactivity ratios The sections on phycal chemical methods IR NMR DSC ect are especially important for studying of structure and properties of synthesized monomer and polymer compounds The book is finely illustrated with about hundred original figures schemes and tables including kinetics NMR IR spectroscopy biocide and other data *Advanced Fibre-Reinforced Polymer (FRP) Composites for Structural Applications* Jiping Bai,2013-09-30 Advanced fibre reinforced polymer FRP composites have become essential materials for the building of new structures and for the repair of existing infrastructure Advanced fibre reinforced polymer FRP composites for structural applications provides an overview of different advanced FRP composites and the use of these materials in a variety of application areas Part one introduces materials used in the creation of advanced FRP composites including polyester vinylester and epoxy resins Part two goes on to explore the processing and fabrication of advanced FRP composites and includes chapters on prepreg processing and filament winding processes Part three highlights properties of advanced FRP composites and explores how performance can be managed and tested Applications of advanced FRP composites including bridge engineering pipe rehabilitation in the oil

and gas industry and sustainable energy production are discussed in part four With its distinguished editor and international team of expert contributors Advanced fibre reinforced polymer FRP composites for structural applications is a technical resource for researchers and engineers using advanced FRP composites as well as professionals requiring an understanding of the production and properties of advanced FRP composites and academics interested in this field Provides an overview of different advanced FRP composites and the use of these materials in a variety of application areas Introduces materials used in the creation of advanced FRP composites including polyester vinylester and epoxy resins Explores the processing and fabrication of advanced FRP composites and includes chapters on prepreg processing and filament winding processes

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