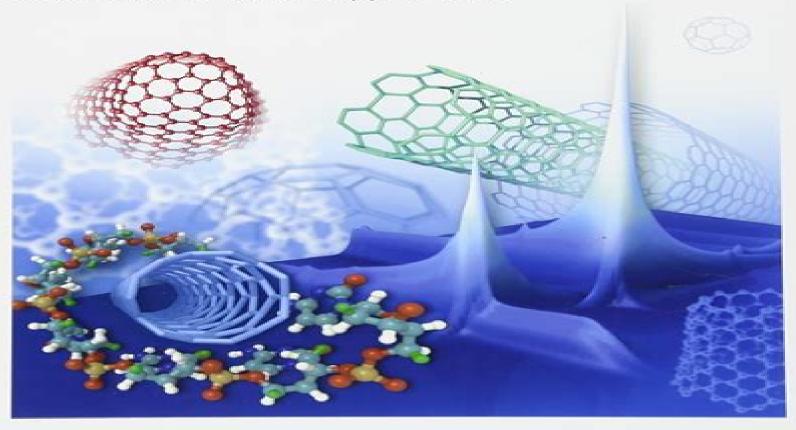


Carbon Nanotubes and Related Structures

Synthesis, Characterization, Functionalization, and Applications



Anish Khan, Mohammad
Jawaid, Abdullah M. Asiri, Inamuddin

Carbon Nanotubes and Related Structures Dirk M. Guldi, Nazario Martín, 2010-01-26 Written by the most prominent experts and pioneers in the field this ready reference combines fundamental research recent breakthroughs and real life applications in one well organized treatise As such both newcomers and established researchers will find here a wide range of current methods for producing and characterizing carbon nanotubes using imaging as well as spectroscopic techniques One major part of this thorough overview is devoted to the controlled chemical functionalization of carbon nanotubes covering intriguing applications in photovoltaics organic electronics and materials design The latest research on novel carbon derived structures such as graphene nanoonions and carbon pea pods round off the book **Carbon Nanotube and Related Field Emitters** Yahachi Saito, 2010-10-01 Carbon nanotubes CNTs have novel properties that make them potentially useful in many applications in nanotechnology electronics optics and other fields of materials science These characteristics include extraordinary strength unique electrical properties and the fact that they are efficient heat conductors Field emission is the emission of electrons from the surface of a condensed phase into another phase due to the presence of high electric fields CNT field emitters are expected to make a breakthrough in the development of field emission display technology and enable miniature X ray sources that will find a wide variety of applications in electronic devices industry and medical and security examinations. This first monograph on the topic covers all aspects in a concise yet comprehensive manner from the fundamentals to applications Divided into four sections the first part discusses the preparation and characterization of carbon nanotubes while part two is devoted to the field emission properties of carbon nanotubes including the electron emission mechanism characteristics of CNT electron sources and dynamic behavior of CNTs during operation Part three highlights field emission from other nanomaterials such as carbon nanowalls diamond and silicon and zinc oxide nanowires before concluding with frontier R D applications of CNT emitters from vacuum electronic devices such as field emission displays to electron sources in electron microscopes X ray sources and microwave amplifiers Edited by a pioneer in the field each chapter is written by recognized experts in the respective fields **Chemical Functionalization of Carbon** Nanomaterials Vijay Kumar Thakur, Manju Kumari Thakur, 2015-07-28 Carbon based nanomaterials are rapidly emerging as one of the most fascinating materials in the twenty first century Chemical Functionalization of Carbon Nanomaterials Chemistry and Applications provides a thorough examination of carbon nanomaterials including their variants and how they can be chemically functionalized It also gives a comprehe Handbook of Carbon-Based Nanomaterials Sabu Thomas, Sarathchandran C., S.A Ilangovan, Juan Carlos Moreno-Piraján, 2021-07-23 Handbook of Carbon Based Nanomaterials provides a comprehensive overview of carbon based nanomaterials and recent advances in these specialized materials This book opens with a brief introduction to carbon including the different forms of carbon and their range of uses Each chapter systematically covers a different type of carbon based nanomaterial including its individual characteristics synthesis

techniques and applications in industry biomedicine and research This book offers a broad handbook on carbon based nanomaterials detailing the materials aspects applications and recent advances of this expansive topic With its global team of contributing authors Handbook of Carbon Based Nanomaterials collates specific technical expertise from around the world for each type of carbon based nanomaterial Due to the broad nature of the coverage this book will be useful to an interdisciplinary readership including researchers in academia and industry in the fields of materials science engineering chemistry energy and biomedical engineering Covers a range of carbon based nanomaterials including graphene fullerenes and much more Describes key properties synthesis techniques and characterization of each carbon based nanomaterial Discusses a range of applications of carbon based nanomaterials from biomedicine to energy applications and Its Composites Anish Khan, Mohammad Jawaid, Abdullah M. Asiri, Inamuddin, 2018-11-30 Nanocarbon and Its Composites Preparation Properties and Applications provides a detailed and comprehensive review of all major innovations in the field of nanocarbons and their composites including preparation properties and applications Coverage is broad and quite extensive encouraging future research in carbon based materials which are in high demand due to the need to develop more sustainable recyclable and eco friendly methods for materials Chapters are written by eminent scholars and leading experts from around the globe who discuss the properties and applications of carbon based materials such as nanotubes buckytubes fullerenes cones horns rods foams nanodiamonds and carbon black and much more Chapters provide cutting edge up to date research findings on the use of carbon based materials in different application fields and illustrate how to achieve significant enhancements in physical chemical mechanical and thermal properties Demonstrates systematic approaches and investigations from design synthesis characterization and applications of nanocarbon based composites Aims to compile information on the various aspects of synthesis properties and applications of nano carbon based materials Presents a useful reference and technical guide for university academics and postgraduate students Masters and Ph D Nanomaterials Properties Bharat Bhushan, Dan Luo, Scott R. Schricker, Wolfgang Sigmund, Stefan Zauscher, 2014-03-13 Nanomaterials attract tremendous attention in recent researches Although extensive research has been done in this field it still lacks a comprehensive reference work that presents data on properties of different Nanomaterials This Handbook of Nanomaterials Properties will be the first single reference work that brings together the various properties with wide Carbon Nanomaterials Sourcebook Klaus D. Sattler, 2018-09-03 The Carbon Nanomaterials breadth and scope Sourcebook contains extensive interdisciplinary coverage of carbon nanomaterials encompassing the full scope of the field from physics chemistry and materials science to molecular biology engineering and medicine in two comprehensive volumes Written in a tutorial style this second volume of the sourcebook Focuses on nanoparticles nanocapsules nanofibers nanoporous structures and nanocomposites Describes the fundamental properties growth mechanisms and processing of each nanomaterial discussed Explores functionalization for electronic energy biomedical and environmental applications

Showcases materials with exceptional properties synthesis methods large scale production techniques and application prospects Provides the tools necessary for understanding current and future technology developments including important equations tables and graphs Each chapter is dedicated to a different type of carbon nanomaterial and addresses three main areas formation properties and applications This setup allows for quick and easy search making the Carbon Nanomaterials Sourcebook Nanoparticles Nanocapsules Nanofibers Nanoporous Structures and Nanocomposites a must have reference for Handbook of Graphene, Volume 5 Cengiz Ozkan, Umit S. Ozkan, 2019-06-12 The fifth volume scientists and engineers in a series of handbooks on graphene research and applications Graphene is a valuable nanomaterial used in technology The Handbook of Graphene Graphene in Energy Healthcare and Environmental Applications is the fifth volume in the handbook series The book's topics include graphene nanomaterials in energy and environment applications and graphene used as nanolubricant Within the handbook three dimensional graphene materials are discussed as are synthesis and applications in electrocatalysts and electrochemical sensors. The battery topics cover graphene and graphene based hybrid composites for advanced rechargeable battery electrodes graphene based materials for advanced lithium ion batteries graphene based materials for supercapacitors and conductive additives of lithium ion batteries. The book s graphene based sensor information addresses flexible actuators sensors and supercapacitors Nanofillers Partha Pratim Das, Shashank Shekhar, Bhasha Sharma, Vijay Chaudhary, 2023-08-30 This book explores the modifying effects of various nanofillers on mechanical and physical properties of polymer nanocomposites Looking at the four basic aspects of processing characterization properties and applications it analyzes how their features can allow for innovative multifunction within industry Covering design production and manufacture this book focuses on meeting end use requirements and the fabrication of materials The importance of mindful design and the use of an appropriate synthesis method is the primary lens through which theory and practice are discussed This volume looks at the various synthesis methods available for organic nanofillers and what characterizes them Properties including mechanical thermal electrical and tribological are thoroughly examined along with the various computational techniques used to determine them With important sustainable properties nanofillers are essential to meeting the increasing demand for biodegradable and environmentally friendly materials This book details the role nanofillers have to play in sustainability alongside economic factors such as efficient manufacturing processes This book will appeal to both academic and industrial engineers involved with nanofillers in a variety of industries including automotive aerospace and biomedical engineering Polymeric and Nanostructured Materials Aparna Thankappan, Nandakumar Kalarikkal, Sabu Thomas, Aneesa Padinjakkara, 2018-11-20 This volume provides in depth knowledge and recent research on polymers and nanostructured materials from synthesis to advanced applications Leading researchers from industry academia government and private research institutions across the globe have contributed to this volume covering new research on nanocomposites polymer technology and electrochemistry

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