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SynthesisMultifunctional NanomaterialsHandbook of Advanced NanomaterialsNanomaterials and NanocompositesDiamondoidsColloidal DichalcogenidesSpinel NanoferritesFunctional NanomaterialsSynthesis, Technology and Applications of Carbon NanomaterialsCerium Oxide (CeO2): Synthesis, Properties and ApplicationsThe Chemistry of NanomaterialsNano materialsBio-Based NanomaterialsNanostructures and NanomaterialsNanostructures & NanomaterialsNanocrystals: Fundamentals of NanomaterialsHandbook of Advanced NanomaterialsNano technologySmart Nanomaterials: Synthesis, Properties and ApplicationsNano materialsOrganic NanomaterialsChemistryNANOMATERIALS Synthesis, Properties, and Applications of Oxide NanomaterialsPolymer Composites with Functional Nanoparticles: Synthesis, Properties, and Applications reviews the latest research in the area of polymer nanocomposites and functionalized nanoparticles, providing an introduction for those new to the field, and supporting further research and development. The book helps researchers and practitioners better understand the key role of nanoparticle functionalization for improving the compatibility of inorganic metallic nanomaterials with organic polymers, and for the fabrication of nanostructured materials with special properties. A range of nanoparticles, such as carbon nanotubes are covered, along with descriptions of the methods of functionalization to support better compatibility with polymer matrices. The book also discusses the various applications of this technology, including uses in electronics and the medical and energy industries. Summarizes the latest research in functionalized nanoparticles for modification of polymer matrices, providing a valuable platform for further research. Includes functionalization of a range of nanoparticles for incorporation into nanocomposites, including carbon nanotubes, graphene, gold and silver, silica and clay. Provides detailed coverage of application areas, including energy, electronics, biomedical applications, and end-of-life considerations. This book provides an overview of key current developments in the synthetic strategy of functional novel nanomaterials in various spectroscopic characterizations and evaluations and highlights possible future applications in nanotechnology and materials science. It illustrates the wide-ranging interest in these areas and provides a background to the later chapters, which address the novel synthesis of high-yield nanomaterials and their biomaterials, graphene, polymeric nanomaterials, green nanomaterials, green polyester, liquid crystal electro-optic switching applications, nanobiotechnology, transition metal oxides, response characteristics of exclusive spectroscopic investigation as well as electron microscopic study, flexible and transparent electrodes, optoelectronics, nanoelectronics, smart displays, switchable device modulation, health care, energy storage, solar/fuel cells, environmental and plant biology, social, ethical, and regulatory implications of various aspects of green nanotechnology, as well as significant foreseeable spectroscopic applications of key functional nanomaterials. Given appropriate regulation for and research on the topics covered, commercial production of manufactured novel composite materials can be realized. Furthermore, the many discoveries highlighted in the book can modulate spectroscopic performances with technical excellence in multidisciplinary research of high competence. This book presents advanced synthesis techniques adopted to fabricate two-dimensional (2D) transition metal dichalcogenides (TMDs) materials with its enhanced properties towards their utilization in various applications such as, energy storage devices, photovoltaics, electrocatalysis,
electronic devices, photocatalysts, sensing and biomedical applications. It provides detailed coverage on everything from the synthesis and properties to the applications and future prospects of research in 2D TMD nanomaterials. With this handbook the distinguished team of editors has combined the expertise of leading nanomaterials scientists to provide the latest overview of this field. The authors cover the whole spectrum of nanomaterials, ranging from theory, synthesis, properties, characterization to application, including such new developments as: quantum dots, nanoparticles, nanoporous materials, as well as nanowires, nanotubes and nanostructural polymers, nanocatalysis, nanolithography, nanomanipulation, and methods for the synthesis of nanoparticles. The book can thus be recommended for everybody working in nanoscience: Beginners can acquaint themselves with the exciting subject, while specialists will find answers to all their questions plus helpful suggestions for further research. This is the most comprehensive book on nanocrystals on the market. It is an up-to-date monograph on an important aspect of nanoscience and technology. It opens with an elegant introduction including a brief historical account. Emphasis is then given to diverse synthetic methods, both chemical and physical, in addition to modern hybrid methods. Tables providing information at a glance, cartoons and schematic diagrams, make the monograph appealing to read. This book summarizes the synthesis, properties, characterization, and application of viral and antiviral nanomaterials by using interdisciplinary subjects ranging from materials science to biomedical science. Viral and Antiviral Nanomaterials: Synthesis, Properties, Characterization, and Application highlights attainments in utilizing nanomaterials as powerful tools for the treatment of viral infections in plants, animals, and humans. It reviews the adopted strategies for designing viral and antiviral nanomaterials for medical applications, including cancer therapy and drug delivery. It also explains the different kinds of antiviral nanosized structures, their chemistries, and the attributes that enable them to be suitable targets for nanotherapeutics. The contributors have prepared the content in a comprehensive manner for readers to use their research findings to improve the healthcare of all living beings. FEATURES Reviews the novel tools for synthesis and characterization of nanomaterials as viral and antiviral agents Explores the different applications of currently available nanomaterials for the treatment of viral infections Investigates the role of antiviral nanodrugs in human and plant systems Addresses the activity of nanostructures in drug-delivery systems for cancer treatment Allows readers from various backgrounds to access the advanced research and practices across traditional frontiers Discusses viral nanomaterials as the viable future of antiviral drugs and nanovaccines in animals and humans This authoritative book is of exceptional relevance to postgraduate scholars, researchers, and scientists interested in nanomedicine, biomedical science, materials science, biopharmaceutical technology, microbiology, and virology to improve virus- and cancer-based therapeutic tools for animal and human welfare. Nanomaterials Synthesis: Design, Fabrication and Applications combines the present and emerging trends of synthesis routes of nanomaterials with the incorporation of various technologies. The book covers the new trends and challenges in the synthesis and surface engineering of a wide range of nanomaterials, including emerging technologies used for their synthesis. Significant properties, safety and sustainability and environmental impacts of the synthesis routes are explored. This book is an important information source that will help materials scientists and engineers who want to learn more about how different classes of nanomaterials are designed. Highlights recent developments in, and opportunities created by, new nanomaterials synthesis methods Explains major synthesis techniques for different types of nanomaterials Discusses the challenges of using a variety of synthesis methods A collection of highly selected, peer-reviewed chapters, this book showcases the research of an international roster of scientists. It covers nanomaterials with emphasis on synthesis, characterization, and applications. It also presents emerging developments in nanotechnology in areas as diverse as medicine, energy, electronics, and agriculture. In addition to engineering aspects, the book discusses the physics, chemistry and biotechnology behind the fabrication and device designing. This text focuses on the synthesis, properties and applications of nanostructures and nanomaterials, particularly inorganic nanomaterials. It provides coverage of the fundamentals and processing techniques with regard to synthesis, properties, characterization and applications of nanostructures and nanomaterials.
based Nanomaterials: Synthesis Protocols, Mechanisms and Applications summarizes recent developments in biocompatible and biodegradable materials, including their properties, fabrication methods, synthesis protocols and applications. The extensive use of petrochemicals, rising levels of plastic waste and manufacturing of non-biodegradable materials is a major environmental problem across the globe. Bio-based nanomaterials offer potential alternatives to address these challenging issues. The book covers key bio-based nanomaterials - including chitin, starch and nanocellulose - detailing their core properties, associated fabrication methods and synthesis protocols. Later chapters look at the range of applications for bio-based nanomaterials, from food and agriculture to environmental and biomedical. This book offers a detailed reference for those interested in sustainable nanoscale materials, including materials scientists, biomedical engineers, environmental scientists, food and agriculture manufacturers and scientists. Covers a range of available bio-based nanomaterials, including chitin, starch and nanocellulose Details the properties and characteristics of each bio-based nanomaterial, focusing on biocompatibility and biodegradability of sustainable materials Reviews the fabrication methods and synthesis protocols available, discussing the pros and cons of each

This important book focuses on the synthesis and fabrication of nanostructures and nanomaterials, but also includes properties and applications of nanostructures and nanomaterials, particularly inorganic nanomaterials. It provides balanced and comprehensive coverage of the fundamentals and processing techniques with regard to synthesis, characterization, properties, and applications of nanostructures and nanomaterials. Both chemical processing and lithographic techniques are presented in a systematic and coherent manner for the synthesis and fabrication of 0-D, 1-D, and 2-D nanostructures, as well as special nanomaterials such as carbon nanotubes and ordered mesoporous oxides. The book will serve as a general introduction to nanomaterials and nanotechnology for teaching and self-study purposes.

Presents the most recent advances in the production and application of various functional nanomaterials As new synthetic methods, characterization technologies, and nanomaterials (NMs) with novel physical and chemical properties are developed, researchers and scientists across disciplines need to keep pace with advancements in the dynamic field. Functional Nanomaterials: Synthesis, Properties and Applications provides comprehensive coverage of fundamental concepts, synthetic methods, characterization technologies, device fabrication, performance evaluation, and both current and emerging applications.

Contributions from leading scientists in academia and industry present research developments of novel functional nanomaterials including metal nanoparticles, two-dimensional nanomaterials, perovskite-based nanomaterials, and polymer-based nanomaterials and nanocomposites. Topics include metal-based nanomaterials for electrochemical water splitting, cerium-based nanostructure materials for electrocatalysis, applications of rare earth luminescent nanomaterials, metal complex nanosheets, and methods for synthesizing polymer nanocomposites. Provides readers with timely and accurate information on the development of functional nanomaterials in nanoscience and nanotechnology Presents a critical perspective of the design strategy, synthesis, and characterization of advanced functional nanomaterials Focuses on recent research developments in emerging areas with emphasis on fundamental concepts and applications Explores functional nanomaterials for applications in areas such as electrocatalysis, bioengineering, optoelectronics, and electrochemistry Covers a diverse range of nanomaterials, including carbonaceous nanomaterials, metal-based nanomaterials, transition metal dichalcogenides-based nanomaterials, semiconducting molecules, and magnetic nanoparticles Functional Nanomaterials: Synthesis, Properties and Applications is an invaluable resource for chemists, materials scientists, electronics engineers, bioengineers, and others in the scientific community working with nanomaterials in the fields of energy, electronics, and biomedicine.

Nanomaterials: Synthesis, Properties and Applications provides a comprehensive introduction to nanomaterials, from how to make them to example properties, processing techniques, and applications. Contributions by leading international researchers and teachers in academic, government, and industrial institutions in nanomaterials provide an accessibleThis book presents synthesis techniques for the preparation of low-dimensional nanomaterials including 0D (quantum dots), 1D (nanowires, nanotubes) and 2D (thin films, few layers), as well as their potential applications
in nanoelectronic systems. It focuses on the size effects involved in the transition from bulk materials to nanomaterials; the electronic properties of nanoscale devices; and different classes of nanomaterials from microelectronics to nanoelectronics, to molecular electronics. Furthermore, it demonstrates the structural stability, physical, chemical, magnetic, optical, electrical, thermal, electronic and mechanical properties of the nanomaterials. Subsequent chapters address their characterization, fabrication techniques from lab-scale to mass production, and functionality. In turn, the book considers the environmental impact of nanotechnology and novel applications in the mechanical industries, energy harvesting, clean energy, manufacturing materials, electronics, transistors, health and medical therapy. In closing, it addresses the combination of biological systems with nanoelectronics and highlights examples of nanoelectronic–cell interfaces and other advanced medical applications. The book answers the following questions: • What is different at the nanoscale? • What is new about nanoscience? • What are nanomaterials (NMs)? • What are the fundamental issues in nanomaterials? • Where are nanomaterials found? • What nanomaterials exist in nature? • What is the importance of NMs in our lives? • Why so much interest in nanomaterials? • What is at nanoscale in nanomaterials? • What is graphene? • Are pure low-dimensional systems interesting and worth pursuing? • Are nanotechnology products currently available? • What are sensors? • How can Artificial Intelligence (AI) and nanotechnology work together? • What are the recent advances in nanoelectronic materials? • What are the latest applications of NMs? Nanomaterials: Synthesis, Properties and Applications provides a comprehensive introduction to nanomaterials, from how to make them to example properties, processing techniques, and applications. Contributions by leading international researchers and teachers in academic, government, and industrial institutions in nanomaterials provide an accessible guide for newcomers to the field. The coverage ranges from isolated clusters and small particles to nanostructured materials, multilayers, and nanoelectronics. The book contains a wealth of references for further reading. Individual chapters deal with relevant aspects of the underlying physics, materials science, and physical chemistry. With this handbook, the distinguished team of editors has combined the expertise of leading nanomaterials scientists to provide the latest overview of this field. They cover the whole spectrum of nanomaterials, ranging from theory, synthesis, properties, characterization to application, including such new developments as quantum dots, nanoparticles, nanoporous materials, nanowires, nanotubes, and nanostructured polymers. The result is recommended reading for everybody working in nanoscience: Newcomers to the field can acquaint themselves with this exciting subject, while specialists will find answers to all their questions as well as helpful suggestions for further research. Timely and comprehensive, this book presents recent advances in magnetic nanomaterials research, covering the latest developments, including the design and preparation of magnetic nanoparticles, their physical and chemical properties as well as their applications in different fields, including biomedicine, magnetic energy storage, wave-absorbing and water remediation. By allowing researchers to get to the forefront developments related to magnetic nanomaterials in various disciplines, this is invaluable reading for the nano, magnetic, energy, medical, and environmental communities. This book highlights the complexity of spinel nanoferrites, their synthesis, physio-chemical properties and prospective applications in the area of advanced electronics, microwave devices, biotechnology as well as biomedical sciences. It presents an overview of spinel nanoferrites: synthesis, properties and applications for a wide audience: from beginners and graduate-level students up to advanced specialists in both academic and industrial sectors. There are 15 chapters organized into four main sections. The first section of the book introduces the readers to spinel ferrites and their applications in advanced electronics industry including microwave devices, whereas the second section mainly focus on the synthesis strategy and their physio-chemical properties. The last sections of the book highlight the importance of this class of nanomaterials in the field of biotechnology and biomedical sector with a special chapter on water purification. Synthesis, Technology and Applications of Carbon Nanomaterials explores the chemical properties of different classes of carbon nanomaterials and their major applications. As carbon nanomaterials are used for a variety of applications due to their versatile properties and characteristics, this book discusses recent advances in synthesis methods,
characterization, and applications of 0D-3D dimensional carbon nanomaterials. It is an essential resource for readers focusing on carbon nanomaterials research. Explores the chemical properties of different classes of carbon nanomaterials and their major applications. Discusses recent advances in synthesis methods, characterization, and applications of 0D-3D dimensional carbon nanomaterials. Discover a new generation of organic nanomaterials and their applications. Recent developments in nanoscience and nanotechnology have given rise to a new generation of functional organic nanomaterials with controlled morphology and well-defined properties, which enable a broad range of useful applications. This book explores some of the most important of these organic nanomaterials, describing how they are synthesized and characterized. Moreover, the book explains how researchers have incorporated organic nanomaterials into devices for real-world applications. Featuring contributions from an international team of leading nanoscientists, Organic Nanomaterials is divided into five parts: Part One introduces the fundamentals of nanomaterials and self-assembled nanostructures. Part Two examines carbon nanostructures—from fullerenes to carbon nanotubes to graphene—reporting on properties, theoretical studies, and applications. Part Three investigates key aspects of some inorganic materials, self-assembled monolayers, organic field effect transistors, and molecular self-assembly at solid surfaces. Part Four explores topics that involve both biological aspects and nanomaterials such as biofunctionalized surfaces. Part Five offers detailed examples of how organic nanomaterials enhance sensors and molecular photovoltaics. Most of the chapters end with a summary highlighting the key points. References at the end of each chapter guide readers to the growing body of original research reports and reviews in the field. Reflecting the interdisciplinary nature of organic nanomaterials, this book is recommended for researchers in chemistry, physics, materials science, polymer science, and chemical and materials engineering. All readers will learn the principles of synthesizing and characterizing new organic nanomaterials in order to support a broad range of exciting new applications. This book is a collection of review articles and research articles, which was published in the Special Issue "Multifunctional Nanomaterials: Synthesis, Properties and Applications" of the International Journal of Molecular Sciences. The study of nanostructures has become, in recent years, a theme common to many disciplines, in which scientists and engineers manipulate matter at the atomic and molecular level in order to obtain materials and systems with significantly improved properties. Carbon nanomaterials have a unique place in nanoscience owing to their exceptional thermal, electrical, chemical, and mechanical properties, finding application in areas as diverse as super strong composite materials, energy storage and conversion, supercapacitors, smart sensors, targeted drug delivery, paints, and nanoelectronics. This book is the first to cover a broad spectrum of carbon nanomaterials, namely carbon nanofibers, vapor-grown carbon fibers, different forms of amorphous nanocarbons besides carbon nanotubes, fullerenes, graphene, graphene nanoribbons, graphene quantum dots, etc. in a single volume. Current oxide nanomaterials knowledge to draw from and build on. Synthesis, Properties, and Applications of Oxide Nanomaterials summarizes the existing knowledge in oxide-based materials research. It gives researchers one comprehensive resource that consolidates general theoretical knowledge alongside practical applications. Organized by topic for easy access, this reference: * Covers the fundamental science, synthesis, characterization, physicochemical properties, and applications of oxide nanomaterials * Explains the fundamental aspects (quantum-mechanical and thermodynamic) that determine the behavior and growth mode of nanostructured oxides * Examines synthetic procedures using top-down and bottom-up fabrication technologies involving liquid-solid or gas-solid transformations * Discusses the sophisticated experimental techniques and state-of-the-art theory used to characterize the structural and electronic properties of nanostructured oxides * Describes applications such as sorbents, sensors, ceramic materials, electrochemical and photochemical devices, and catalysts for reducing environmental pollution, transforming hydrocarbons, and producing hydrogen. With its combination of theory and real-world applications plus extensive bibliographic references, Synthesis, Properties, and Applications of Oxide Nanomaterials consolidates a wealth of current, complex information in one volume for practicing chemists, physicists, and materials scientists, and for engineers and researchers in government, industry, and academia. It's also an outstanding reference
Gold nanoparticles provide a platform for the development of new and efficient diagnostic and therapeutic tools. This book offers a general guide to the synthesis and coating of gold nanoparticles. It describes the links between optical features and geometries of gold nanoparticles and provides a readily comprehensible connection in all the chapters between the geometry of gold nanoparticles and their final applications. An important aspect of nanotechnology is the vastly increased ratio of surface area to volume present in many nanoscale materials, which makes possible new quantum mechanical effects. The main aims of this book are to summarize the fundamentals, synthesis methods, properties and applications of nanomaterials, so as to provide readers with a systematic knowledge on nanomaterials. In addition, the book covers most commonly used characterization tools pertaining to nanomaterials. Further, it deals with relevant aspects of nanocomposites which contains dispersion of nano-sized particulates, and carbon nanotubes (CNTs) in the matrices (polymer, metal and ceramic). It also discusses development of smart nano textiles (intelligent textiles), self-cleaning glass, sensors, actuators, ferro-fluids, and wear resistant nano coatings. Aimed at senior undergraduate and graduate students, the key features on this book include: Top-down and bottom-up approaches for the synthesis of nanomaterials included Illustrates sample preparation and basic principle of characterization tools for nanomaterials Explains calculation of ratios of surface area to volume and surface atoms to bulk atoms Reviews synthesis, properties and applications of carbon nanotubes and magnetic nanomaterials Discusses size effect on thermal, mechanical, optical, magnetic and electrical properties Cerium Oxide (CeO2): Synthesis, Properties and Applications provides an updated and comprehensive account of the research in the field of cerium oxide based materials. The book is divided into three main blocks that deal with its properties, synthesis and applications. Special attention is devoted to the growing number of applications of ceria based materials, including their usage in industrial and environmental catalysis and photocatalysis, energy production and storage, sensors, cosmetics, radioprotection, glass technology, pigments, stainless steel and toxicology. A brief historical introduction gives users background, and a final chapter addresses future perspectives and outlooks to stimulate future research. The book is intended for a wide audience, including students, academics and industrial researchers working in materials science, chemistry and physics. Addresses a wide range of applications of ceria-based materials, including catalysis, energy production and storage, sensors, cosmetics and toxicology Provides the fundamentals of ceria-based materials, including synthesis methods, materials properties, toxicology and surface chemistry Includes nanostructured ceria-based materials and a discussion of future prospects and outlooks Multifunctional Materials: Synthesis, Properties and Applications explores how materials can be downscaled to nanometer-size in order to tailor and control properties. These advanced, low-dimensional materials, ranging from quantum dots and nanoparticles, to ultra-thin films develop multifunctional properties. As well as demonstrating how down-scaling to nano-size can make materials multifunctional, chapters also show how this technology can be applied in electronics, medicine, energy and in the environment. This fresh approach in materials research will provide a valuable resource for materials scientists, materials engineers, chemists, physicists and bioengineers who want to learn more on the special properties of nano-sized materials. Outlines the major synthesis chemical process and problems of advanced nanomaterials Shows how multifunctional nanomaterials can be practically used in biomedical area, nanomedicine, and in the treatment of pollutants Demonstrates how the properties of a variety of materials can be engineered by downsizing them to nano size Comprehensive insights into the emerging field of smart nanomaterials have been provided in this book. It discusses the synthesis, properties and applications of smart nanomaterials. Smart nanomaterials use nano-scale engineering and superior system integration of existing materials to continuously develop better materials and better products. Defense, automobile industries etc. benefit from the development of these materials. This book unfolds the innovative aspects of developing smart nanomaterials, helping the reader to explore the unexplored. As this field is emerging at a fast pace, this book will help the readers to better understand the concepts of synthesizing smart nanomaterials. Fundamentals of Nanoparticles: Classifications, Synthesis Methods, Properties and
Characterization explores the nanoparticles and architecture of nanostructured materials being used today in a comprehensive, detailed manner. This book focuses primarily on the characterization, properties and synthesis of nanoscale materials, and is divided into three major parts. This is a valuable reference for materials scientists, and chemical and mechanical engineers working in R&D and academia, who want to learn more about how nanoparticles and nanomaterials are characterized and engineered. Part one covers nanoparticles formation, self-assembly in the architecture nanostructures, types and classifications of nanoparticles, and signature physical and chemical properties, toxicity and regulations. Part two presents different ways to form nanometer particles, including bottom-up and top-down approaches, the classical and non-classical theories of nanoparticles formation and self-assembly, surface functionalization and other surface treatments to allow practical use. Part three covers characterization of nanoparticles and nanostructured materials, including the determination of size and shape, in addition to atomic and electronic structures and other important properties. Includes new physical and chemical techniques for the synthesis of nanoparticles and architecture nanostructures Features an in-depth treatment of nanoparticles and nanostructures, including their characterization and chemical and physical properties Explains important techniques for the synthesis, fabrication and the characterization of complex nano-architectures Intended as a reference for basic and practical knowledge about the synthesis, characterization, and applications of nanotechnology for students, engineers, and researchers, this book focuses on the production of different types of nanomaterials and their applications, particularly synthesis of different types of nanomaterials, characterization of different types of nanomaterials, applications of different types of nanomaterials, including the nanocomposites. Successor of the highly acclaimed, first full-color introduction to nanomaterials - now including graphenes and carbon nanotubes This full-colored introduction to nanomaterials and nanotechnology in particular addresses the needs of engineers who need to know the special phenomena and potentials, without getting bogged down in the scientific detail of the physics and chemistry involved. Based on the author’s own courses, this textbook shows how to produce nanomaterials and use them in engineering applications for novel products. Following an introduction, the text goes on to treat synthesis, characterization techniques, thermal, optical, magnetic and electronic properties, processing and, finally, emerging applications. A sound overview of the "nano world" from an application-oriented perspective. Reviews for the first edition: "The reader [of this book] profits from the broad scientific teaching experience of the author. This book is highly recommended for everyone who wants to step onto the new and fascinating field of nanomaterials." (International Journal of Materials Research, May 2009) "The practical presentation and clarity in writing style makes this book a winner for anyone wanting to quickly learn about the fundamentals and practical side of nanomaterials." (IEEE Electrical Insulation Magazine, March/April 2009) Over the past few decades, carbon nanomaterials, most commonly fullerenes, carbon nanotubes, and graphene, have gained increasing interest in both science and industry, due to their advantageous properties that make them attractive for many applications in nanotechnology. Another class of the carbon nanomaterials family that has slowly been gaining renewed interest is diamond molecules, also called diamondoids, which consist of polycyclic carbon cages that can be superimposed on a cubic diamond lattice. Derivatives of diamondoids are used in pharmaceutics, but due to their promising properties—well-defined structures, high thermal and chemical stability, negative electron affinity, and the possibility to tune their bandgap—diamondoids could also serve as molecular building blocks in future nanodevices. This book is the first of its kind to give an exhaustive overview of the structures, properties, and current and possible future applications of diamondoids. It contains a brief historical account of diamondoids, from the discovery of the first diamondoid member, adamantane, to the isolation of higher diamondoids about a decade ago. It summarizes the different approaches to synthesizing diamondoids. In particular, current research on the conventional organic synthesis and new approaches based on microplasmas generated in high-pressure and supercritical fluids are reviewed and the advantages and disadvantages of the different methods.
discussed. The book will serve as a reference for advanced undergraduate- and graduate-level students in chemistry, physics, materials science, and nanotechnology and researchers in macromolecular science, nanotechnology, chemistry, biology, and medicine, especially those with an interest in nanoparticles. This book provides a comprehensive collection of the latest information on nanomaterials and nanocomposites. It covers material synthesis, processing, structure characterization, properties and applications. It presents a coherent treatment of how composite properties depend on nanostructure, and covers cutting-edge topics like bionanocomposites for sustainable development. This book summarizes many developments in the field making it an ideal resource for researchers from industry, academia, government and private research institutions.

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