

K M Gupta Material Science Book

This is the seventh set of Handbook of Porphyrin Science. Porphyrins, phthalocyanines and their numerous analogue and derivatives are materials of tremendous importance in chemistry, materials science, physics, biology and medicine. They are the red color in blood (heme) and the green in leaves (chlorophyll); they are also excellent ligands that can coordinate with almost every metal in the Periodic Table. Grounded in natural systems, porphyrins are incredibly versatile and can be modified in many ways; each new modification yields derivatives, demonstrating new chemistry, physics and biology, with a vast array of medicinal and technical applications. As porphyrins are currently employed as platforms for study of theoretical principles and applications in a wide variety of fields, the Handbook of Porphyrin Science represents a timely ongoing series dealing in detail with the synthesis, chemistry, physicochemical and medical properties and applications of polypyrrole macrocycles. Professors Karl Kadish, Kevin Smith and Roger Guilard are internationally recognized experts in the research field of porphyrins, each having his own separate area of expertise in the field. Between them, they have published over 1500 peer-reviewed papers and edited more than three dozen books on diverse topics of porphyrins and phthalocyanines. In assembling the new volumes of this unique handbook, they have selected and attracted the very best scientists in each sub-discipline as contributing authors. This handbook will prove to be a modern authoritative treatise on the subject as it is a collection of up-to-date works by world-renowned experts in the field. Complete with hundreds of figures, tables and structural formulas, and thousands of literature citations, all researchers and graduate students in this field will find the Handbook of Porphyrin Science an essential, major reference source for many years to come. Materials science includes those parts of chemistry and physics that deal with the properties of materials. It encompasses four classes of materials, the study of each of which may be considered a separate field: metals; ceramics; polymers and composites. Materials science is often referred to as materials science and engineering because it has many applications. Industrial applications of materials science include processing techniques (casting, rolling, welding, ion implantation, crystal growth, thin-film deposition, sintering, glassblowing, etc.), analytical techniques (electron microscopy, x-ray diffraction, calorimetry, nuclear microscopy (HEFIB) etc.), materials design, and cost/benefit tradeoffs in industrial production of materials. This book presents new research directions in a very new field which happens to be an old field as well.

Modelling and Simulation in the Science of Micro- and Meso-Porous Materials addresses significant developments in the field of micro- and meso-porous science. The book includes sections on Structure Modeling and Prediction, Synthesis, Nucleation and Growth, Sorption and Separation processes, Reactivity and Catalysis, and Fundamental Developments in Methodology to give a complete overview of the techniques currently utilized in this rapidly advancing field. It thoroughly addresses the major challenges in the field of microporous materials, including the crystallization mechanism of porous materials and rational synthesis of porous materials with controllable porous structures and compositions. New applications in emerging areas are also covered, including biomass conversion, C1 chemistry, and CO2 capture. Authored and edited by experts in the field of micro- and meso-porous materials. Includes introductory material and background both on the science of microporous materials and on the techniques employed in contemporary modeling studies. Rigorous enough for scientists conducting related research, but also accessible to graduate students in chemistry, chemical engineering, and materials science.

Selected, peer reviewed papers from the 6th International Conference on Advanced Materials Research, January 22-24, 2016, Torino, Italy

Processes and Applications

Fabrication, Properties, Applications, and Advancements

Introduction to Materials Science for Engineers

Research, Applications and Advances

Advanced Semiconducting Materials and Devices

Materials are the foundation of technology. As such, most universities provide engineering undergraduates with the fundamental concepts of materials science, including crystal structures, imperfections, phase diagrams, materials processing, and materials properties. Few, however, offer the practical, applications-oriented

background that their stud

This comprehensive and unique book is intended to cover the vast and fast-growing field of electrical and electronic materials and their engineering in accordance with modern developments. Basic and pre-requisite information has been included for easy transition to more complex topics. Latest developments in various fields of materials and their sciences/engineering, processing and applications have been included. Latest topics like PLZT, vacuum as insulator, fiber-optics, high temperature superconductors, smart materials, ferromagnetic semiconductors etc. are covered. Illustrations and examples encompass different engineering disciplines such as robotics, electrical, mechanical, electronics, instrumentation and control, computer, and their inter-disciplinary branches. A variety of materials ranging from iridium to garnets, microelectronics, micro alloys to memory devices, left-handed materials, advanced and futuristic materials are described in detail. In today's world, bioplastics are becoming increasingly prominent owing mainly to scarcity of oil, increase in the cost of petroleum-based commodities, and growing environmental concerns with the dumping of non-biodegradable plastics in landfills. This book summarizes the field of bioplastics by illustrating how they form a unique class of research area that integrates pure and applied sciences such as chemistry, engineering and material science, to initiate solutions. Compelling science demystifies this complex and often ambiguous branch of study for benefit of all those concerned with bioplastics.

Polysaccharide Nanoparticles: Preparation and Biomedical Applications provides detailed information on polysaccharides nanoparticles in terms of their synthesis and applications. Naturally occurring polysaccharides are widely used as food materials, particularly in Asia. Different kinds of polysaccharide materials are available from nature with various resources such as crustaceans and algae. The exploration and exploitation of polysaccharides nanoparticles from natural resource is at the heart of this book, which also explores the synthesis, preparation and applications of polysaccharides nanoparticles for tissue engineering and food applications. This is an important reference for materials scientists and bioengineers who are looking to gain a greater understanding on how polysaccharides nanoparticles are being used for a variety of biomedical applications. Explains the major synthesis and preparation methods of polysaccharide-based nanoparticles. Demonstrates how polysaccharides nanoparticles are being used for a range of biomedical applications, including tissue engineering, drug delivery and biosensors. Assesses the major challenges and risks of using polysaccharides nanoparticles safely and effectively.

Trends in Materials Science Research

Encyclopedia of Knowledge Management, Second Edition

Mechanics, Simulation and Control III

Natural Fiber-Reinforced Composites

An Intermediate Text

Selected, peer reviewed papers from the 2013 3rd International Conference on Advanced Materials Research (ICAMR 2013), January 19-20, 2013, Dubai, UAE

Introduces Emerging Engineering Materials Mechanical, materials, and production engineering students can greatly benefit from **Engineering Materials: Research, Applications and Advances**. This text focuses heavily on research, and fills a need for current information on the science, processes, and applications in the field. Beginning with a brief overview, the book provides a historical and modern perspective on material science, and describes various types of engineering materials. It examines the industrial process for emerging materials, determines practical use under a wide range of conditions, and establishes what is needed to produce a new generation of materials. **Covers Basic Concepts and Practical Applications** The book consists of 18 chapters and covers a variety of topics that include functionally graded materials, auxetic materials, whiskers, metallic glasses, biocomposite materials, nanomaterials, superalloys, superhard materials, shape-memory alloys, and smart materials. The author outlines the latest advancements, including futuristic plastics, sandwich composites, and biodegradable composites, and highlights special kinds of composites, including fire-resistant composites, marine composites, and biomimetics. He also factors in current examples, future prospects, and the latest research underway in materials technology. Contains approximately 160 diagrams and 85 tables. Incorporates examples, illustrations, and applications used in a variety of engineering disciplines. Includes solved numerical examples and objective questions with answers. **Engineering Materials: Research, Applications and Advances** serves as a textbook and reference for advanced/graduate students in mechanical engineering, materials engineering, production engineering, physics, and chemistry, and relevant researchers and practicing professionals in the field of materials science.

Natural Fiber-Reinforced Composites In-depth overview of thermal analysis of natural fiber-reinforced composites In **Natural Fiber-Reinforced Composites: Thermal Properties and Applications**, a team of distinguished researchers has delivered a comprehensive overview of the thermal properties of natural fiber-reinforced polymer composites. The book brings together information currently dispersed throughout the scientific literature and offers viable and environmentally friendly alternatives to conventional composites.

The book highlights the thermal analysis of natural fiber-reinforced composites with techniques such as Thermogravimetric Analysis, Dynamic Mechanical Analysis, Thermomechanical Analysis, Differential Scanning Calorimetry, etc. This book provides: A thorough review of the thermal characterization of natural fiber-based hybrid composites. Detailed investigation of the thermal properties of polymer composites reinforced with various natural fibers such as flax fiber, pineapple leaf fiber, sisal, sugar palm, grass fiber and cane fiber. Discussions on the thermal properties of hybrid natural fiber-reinforced composites with various thermosetting and thermoplastic polymers. Influence of nanofillers on the thermal stability and thermal decomposition characteristics of the natural fiber-based hybrid composites. **Natural Fiber-Reinforced Composites: Thermal**

Properties and Applications is a must-read for materials scientists, polymer chemists, and professionals working in the industry. This book is ideal for readers seeking to make an informed decision regarding materials selection for applications involving thermal insulation and elevated temperature. The suitability of natural fiber-reinforced composites in the automotive, mechanical, and civil engineering sectors is highlighted.

This text provides a balanced and current treatment of the full spectrum of engineering materials, covering all the physical properties, applications and relevant properties associated with the subject. It explores all the major categories of materials while offering detailed examinations of a wide range of new materials with high-tech applications.

Applied Materials Science

26th Annual Conference on Composites, Advanced Ceramics, Materials, and Structures - B

Selected, Peer Reviewed Papers from the 2013 2nd International Conference on Material Science and Engineering Technology (ICMSET 2013), November 16-17, 2013, London, United Kingdom

Preparation and Biomedical Applications

Fundamentals and Applications

Two Dimensional Nanostructures for Biomedical Technology: A Bridge between Materials Science and Bioengineering helps researchers to understand the promising aspects of two dimensional nanomaterials. Sections cover the biomedical applications of such nanostructures in terms of their precursors, structures, morphology and size. Further, detailed synthetic methodologies guide the reader towards the efficient generation of two dimensional nanostructures. The book encompasses the vital aspects of two dimensional nanomaterials in context of their utility in biomedical technology, thus presenting a thorough guide for researchers in this area. Details the latest on the structure, morphology and shape-size accords of two dimensional nanomaterials. Includes synthetic strategies with feasibility for sustainability. Reports on two dimensional nanostructures in biomedical technology, including bio-imaging, biosensing, drug delivery and tissue engineering.

Biopolymeric Nanomaterials: Fundamentals and Applications outlines the fundamental design concepts and emerging applications of biopolymeric nanomaterials. The book also provides information on emerging applications of biopolymeric nanomaterials, including in biomedicine, manufacturing and water purification, as well as assessing their physical, chemical and biological properties. This is an important reference source for materials scientists, engineers and biomedical scientists who are seeking to increase their understanding of how polymeric nanomaterials are being used for a range of biomedical and industrial applications. Biopolymeric nanomaterials refer to biocompatible nanomaterials, consisting of biopolymers, such as protein (silk, collagen, gelatin, β -casein, zein, and albumin), protein-mimicked polypeptides and polysaccharides (chitosan, alginate, pullulan, starch, and heparin). Biopolymeric nanomaterials may be used as i) delivery systems for bioactive compounds in food application, (ii) for delivery of therapeutic molecules (drugs and genes), or for (iii) tissue engineering. Provides information on the design concepts and synthesis of biopolymeric nanomaterials in biomedical and industrial applications. Highlights the major properties and processing methods for biopolymeric nanomaterials. Assesses the major challenges of producing biopolymeric nanomaterials on an industrial scale.

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Composite materials are used as substitutions of metals/traditional materials in aerospace, automotive, civil, mechanical and other industries. The present book collects the current knowledge and recent developments in the characterization and application of composite materials. To this purpose the volume describes the outstanding properties of this class of advanced material which recommend it for various industrial applications.

Engineering Steels and High Entropy-Alloys

Handbook of Porphyrin Science (Volumes 36 - 40): With Applications to Chemistry, Physics, Materials Science, Engineering, Biology and Medicine

Annual Report, Research in Materials

Biopolymeric Nanomaterials

Materials Science

The book presents a comprehensive survey about advanced solar cell technologies. Focus is placed on semiconductor materials, solar cell efficiency, improvements in surface recombination velocity, charge density, high ultraviolet (UV) sensitivity, modeling of solar cells etc. The book references 281 original resources with their direct web links for in-depth reading. Keywords: Solar Cells, Thin Film Solar Cells, Solar Cell Efficiency, Semiconductor Materials, Surface Recombination Velocity, Charge

Density, High UV Sensitivity, Heavily-doped Silicon Wafers, Amorphous Semiconductors, Nanocrystalline Semiconductors, Field Effect, Ferroelectric Semiconductors, Solar Cell Modelling.

Knowledge Management has evolved into one of the most important streams of management research, affecting organizations of all types at many different levels. The Encyclopedia of Knowledge Management, Second Edition provides a compendium of terms, definitions and explanations of concepts, processes and acronyms addressing the challenges of knowledge management. This two-volume collection covers all aspects of this critical discipline, which range from knowledge identification and representation, to the impact of Knowledge Management Systems on organizational culture, to the significant integration and cost issues being faced by Human Resources, MIS/IT, and production departments.

This book provides an overview on the latest technology and applications of bio-based fiber composite materials. It covers the mechanical and thermal properties of bio-fibers for polymeric resins and explains the different pre-treatment methods used by the researchers for the enhancement. In addition, this book also presents a complete analysis on the tribological behavior of bio-fiber reinforced polymer composites to appreciate the friction and wear behavior. This book would be a handy to the industrial practitioners and researchers in the direction of achieving optimum design for the components made of natural fiber based polymer matrix composites. This book presents the select proceedings of the International Conference on Functional Material, Manufacturing and Performances (ICFMMP) 2019. The book provides the state-of-the-art research, development, and commercial prospective of recent advances in materials science and engineering. The contents cover various synthesis and fabrication routes of functional and smart materials for applications in mechanical engineering, manufacturing, metrology, nanotechnology, physics, chemical and biological sciences, civil engineering, food science among others. It also provides the evolutionary behavior of materials science for industrial applications. This book will be a useful resource for researchers as well as professionals interested in the highly interdisciplinary field of materials science.

Modelling and Simulation in the Science of Micro- and Meso-Porous Materials

Handbook of Porphyrin Science (Volumes 1 - 5): With Applications to Chemistry, Physics, Materials Science, Engineering, Biology and Medicine

Material Science

Advanced Electrical and Electronics Materials

Material Science and Engineering Technology II

This book presents the latest developments in semiconducting materials and devices, providing up-to-date information on the science, processes, and applications in the field. A wide range of topics are covered, including optoelectronic devices, metal-semiconductor junctions, heterojunctions, MISFETs, LEDs, semiconductor lasers, photodiodes, switching diodes, tunnel diodes, Gunn diodes, solar cells, varactor diodes, IMPATT diodes, and advanced semiconductors. Detailed attention is paid to advanced and futuristic materials. In addition, clear explanations are provided of, for example, electron theories, high-field effects, the Hall effect, transit-time effects, drift and diffusion, breakdown mechanisms, equilibrium and transient conditions, switching, and biasing. The book is designed to meet the needs of undergraduate engineering students and will also be very useful for postgraduate students; it will assist in preparation for examinations at colleges and universities and for other examinations in engineering. Practice questions are therefore presented in both essay and multiple choice format, and many solved examples and unsolved problems are included.

Collection of selected, peer reviewed papers from the 2013 International Conference on Mechanics, Simulation and Control (ICMSP 2013), June 22-23, 2013, Kanyakumari, India. The 99 papers are grouped as follows: Chapter 1: Advanced Materials Engineering and Technologies; Chapter 2: Mechanical Engineering and Design, Applied Mechanics; Chapter 3: Electrical Engineering and Electric Machines; Chapter 4: Power System and Electronics, Energy Engineering, Its Applications; Chapter 5: Instrumentation, Measurement Technologies, Analysis and Methodology; Chapter 6: Modern Control, Automation and Robotic Engineering; Chapter 7: Manufacturing and Industrial Engineering, Management Applications; Chapter 8: Information Technologies, Communication and Networks Engineering.

Collection of selected, peer reviewed papers from the 2013 2nd International Conference on Material Science and Engineering Technology (ICMSET 2013), November 16-17, 2013, London, United Kingdom. The 72 papers are grouped as follows: Chapter 1: Composite Materials; Chapter 2: Chemical Materials and Technologies; Chapter 3: Modelling and Analysis of Materials Properties and Technologies; Chapter 4: Nanomaterials and Nanotechnologies; Chapter 5: Advances in Energy Technology; Chapter 6: Applied Mechanics and Mechanical Engineering

Collection of selected, peer reviewed papers from the 2015 5th International Conference on Advanced Materials Research (ICAMR 2015), January 7-8, 2015, Doha, Qatar. The 69 papers are grouped as follows: Chapter 1: Composites and Specialized Composites; Chapter 2: Intelligent and Electronic Materials, Magnetic Materials; Chapter 3: Optics and Solar Materials; Chapter 4: Novel Researches on Machining and Processing of Materials; Chapter 5: Synthesis and Characterization of Materials; Chapter 6: Nanotechnologies: Nanofluids, Nanoribbon, Nano Thin Films; Chapter 7: Researches on Materials Science and Technology

Applications of Engineering Materials in Structural, Electronics, Thermal, and Other Industries

Two-Dimensional Nanostructures for Biomedical Technology

Advanced Materials Research VI

Advanced Materials Research V

The science and study of functionally graded materials (FGMs) have intrigued researchers over the last few decades. Their application has the capability to produce parts with unmatched properties which are virtually impossible to obtain via conventional material routes. This book addresses various FGM aspects and provides a relevant, high-quality, and comprehensive data source. The book covers trends, process classification on various bases, physical processes involved, structure, properties, applications, advantages, and limitations. Emerging trends in the field are discussed in detail and advancements are thoroughly reviewed and presented to broaden the spectrum of FGM applications. This reference book will be of interest to scholars, researchers, academicians, industry practitioners, government labs, libraries, and anyone interested in the area of materials engineering.

This is the first set of Handbook of Porphyrin Science. Porphyrins, phthalocyanines and their numerous analogues and derivatives are materials of tremendous importance in chemistry, materials science, physics, biology and medicine. They are the red color in blood (heme) and the green in leaves (chlorophyll); they are also excellent ligands that can coordinate with almost every metal in the Periodic Table. Grounded in natural systems, porphyrins are incredibly versatile and can be modified in many ways; each new modification yields derivatives demonstrated new chemistry, physics and biology, with a vast array of medicinal and technical applications. As porphyrins are currently employed as platforms for study of theoretical principles and applications in a wide variety of fields, the Handbook of Porphyrin Science represents a timely ongoing series dealing in detail with the synthesis, chemistry, physicochemical and medical properties and applications of polypyrrole macrocycles. Professors Karl Kadish, Kevin Smith and Roger Guilard are internationally recognized experts in the research field of porphyrins, each having his own separate area of expertise in the field. Between them, they have published over 1500 peer-reviewed papers and edited more than three dozen books on diverse topics of porphyrins and phthalocyanines. In assembling the new volumes of this unique Handbook, they have selected and attracted the very best scientists in each sub-discipline as contributing authors of the chapters. This Handbook will prove to be a modern authoritative treatise on the subject as it is a collection of up-to-date works by world-renowned experts in the field. Complete with hundreds of figures, tables and structural formulas, and thousands of literature citations, all researchers and graduate students in this field will find the Handbook of Porphyrin Science an essential, major reference source for many years to come.

Volume is indexed by Thomson Reuters CPCI-S (WoS). Collection of selected, peer reviewed papers from the 2013 2nd International Conference on Material Science and Engineering Technology (ICMSET 2013), November 16-17, 2013, London, United Kingdom. The 72 papers are grouped as follows: Chapter 1: Composite Materials; Chapter 2: Chemical Materials and Technologies; Chapter 3: Modelling and Analysis of Materials Properties and Technologies; Chapter 4: Nanomaterials and Nanotechnologies; Chapter 5: Advances in Energy Technology; Chapter 6: Applied Mechanics and Mechanical Engineering. This volume is part of the Ceramic Engineering and Science Proceeding (CESP) series. This series contains a collection of papers dealing with issues in both traditional ceramics (i.e., glass, whitewares, refractories, and porcelain enamel) and advanced ceramics. Topics covered in the area of advanced ceramic include bioceramics, nanomaterials, composites, solid oxide fuel cells, mechanical properties and structural design, advanced ceramic coatings, ceramic armor, porous ceramics, and more.

Functionally Graded Materials (FGMs)

Processing, Applications, Characterizations

A Bridge between Material Science and Bioengineering

Green Approaches to Biocomposite Materials Science and Engineering

Advances in Materials Science and Engineering

This exciting textbook on the structure, property and applications of materials, is written for advanced undergraduate courses on the principles of Materials Science. It covers the main topics commonly encountered by students in materials science and engineering but explores them in greater depth than standard introductory textbooks, making it ideal for use on a second-level course and upwards. Major topics covered include crystallography, symmetry and bonding-related properties, phase diagrams and transformations, ordering, diffusion, solidification, and dedicated chapters on amorphous, liquid crystal, magnetic and novel materials, including shape memory. Each chapter contains numerous illustrative examples, problem sets, references and notes of interest to aid student understanding, with a chapter of hints on engineering calculations to ensure mathematical competency.

Industrial ecology, eco-efficiency, and green chemistry are guiding the development of the next generation of materials, products, and processes. Considerable growth has been seen in the use of biocomposites in the domestic sector, building materials, aerospace industry, circuit boards, and automotive applications over the past decade, but application in other sectors until now has been limited. Green Approaches to Biocomposite Materials Science and Engineering explores timely research on the various available types of natural fibers and the use of these fibers as a sustainable alternative to synthetic fibers and polymers. Emphasizing research-based solutions for sustainability across various industries, this publication is an essential reference source for engineers, researchers, environmental scientists, and graduate-level students.

Prepared as a textbook complete with problems after each chapter, specifically intended for classroom use in universities.

"This book entitled "Engineering Steels and High Entropy-Alloys" presents an overview of various types of advanced steels and high entropy alloys. It also discusses the current research trends, problems, and applications of engineering steels and high entropy materials. The book also gives a brief overview of advances in surface protection strategies of steels and laser processing of materials (additive manufacturing). The various key features of this book include: 1. A comprehensive overview of various types of engineering steels, phase transformation, and applications in engineering. 2. A complete detailed understanding and mechanism of high entropy materials, including high entropy alloys and ceramics. 3. Descriptions of structure-property relationships in high entropy materials and their application in various

fields such as biomedical implants. 4. A brief review of various laser processing (additive manufacturing) and surface protection of advanced materials."

Select Proceedings of ICFMMP 2019

Engineering Materials

Handbook of Porphyrin Science (Volumes 31 – 35): With Applications to Chemistry, Physics, Materials Science, Engineering, Biology and Medicine

Annual Report [on] Research in Materials

The Materials Science of Thin Films

The Book Has Been Designed To Cover All Relevant Topics In B.E. (Mechanical/Metallurgy / Material Science / Production Engineering), M.Sc. (Material Science), B.Sc. (Honours), M.Sc. (Physics), M.Sc. (Chemistry), Amie And Diploma Students. Students Appearing For Gate, Upsc, Net, Slet And Other Entrance Examinations Will Also Find Book Quite Useful. In Nineteen Chapters, The Book Deals With Atomic Structure, The Structure Of Solids; Crystal Defects; Chemical Bonding; Diffusion In Solids; Mechanical Properties And Tests Of Materials; Alloys, Phase Diagrams And Phase Transformations; Heat Treatment; Deformation Of Materials; Oxidation And Corrosion; Electric, Magnetic, Thermal And Optical Properties; Semiconductors; Superconductivity; Organic Materials; Composites; And Nanostructured Materials. Special Features: * Fundamental Principles And Applications Are Discussed With Explanatory Diagrams In A Clear Way. * A Full Coverage Of Background Topics With Latest Development Is Provided. * Special Chapters On Nanostructured Materials, Superconductivity, Semiconductors, Polymers, Composites, Organic Materials Are Given . * Solved Problems, Review Questions, Problems, Short-Question Answers And Typical Objective Type Questions Alongwith Suggested Readings Are Given With Each Chapter.

Engineering Materials Research, Applications and Advances CRC Press

Handbook of Bioplastics and Biocomposites Engineering Applications

Thermal Properties and Applications

Semiconductor Materials and Modelling for Solar Cells

Mechanical, Thermal and Tribological Properties

Composite Materials