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KEY=PRESS - JAELYN ADRIENNE

SUPERCONDUCTING MATERIALS

FUNDAMENTALS, SYNTHESIS AND APPLICATIONS

Springer Nature

HANDBOOK OF SUPERCONDUCTING MATERIALS

CRC Press

FRONTIERS IN SUPERCONDUCTING MATERIALS

Springer Science & Business Media *Frontiers in Superconducting Materials* gives a state-of-the-art report of the most important topics of the current research in superconductive materials and related phenomena. It comprises 30 chapters written by renowned international experts in the field. It is of central interest to researchers and specialists in Physics and Materials Science, both in academic and industrial research, as well as advanced students. It also addresses electronic and electrical engineers. Even non-specialists interested in superconductivity might find some useful answers.

THERMAL PROPERTIES OF SOLIDS AT ROOM AND CRYOGENIC TEMPERATURES

Springer *The minimum temperature in the natural universe is 2.7 K. Laboratory refrigerators can reach temperatures in the microkelvin range. Modern industrial refrigerators cool foods at 200 K, whereas space mission payloads must be capable of working at temperatures as low as 20 K. Superconducting magnets used for NMR work at 4.2 K. Hence the properties of materials must be accurately known also at cryogenic temperatures. This book provides a guide for engineers, physicists, chemists, technicians who wish to approach the field of low-temperature material properties. The focus is on the thermal properties and a large spectrum of experimental cases is reported. The book presents updated tables of low-temperature data on materials and a thorough bibliography supplements any further research. Key Features include:*

- ° Detailed technical description of experiments
- ° Description of the newest cryogenic apparatus
- ° Offers data on cryogenic properties of the latest new materials
- ° Current reference review

HANDBOOK OF SUPERCONDUCTING MATERIALS

CRC Press *With the advent of High Temperature Superconductivity and the increasing reliability of fabrication techniques, superconductor technology has moved firmly into the mainstream of academic and industrial research. There is currently no single source of practical information giving guidance on which technique to use for any particular category of superconductor. An increasing number of materials scientists and electrical engineers require easy access to practical information, sensible advice and guidance on 'best-practice' and reliable, proven fabrication and characterisation techniques. The Handbook will be the definitive collection of material describing techniques for the fabrication and analysis of superconducting materials. In addition to the descriptions of techniques, authoritative discussions written by leading researchers will give guidance on the most appropriate technique for a particular situation. Characterisation and measurement techniques will form an important part of the Handbook, providing researchers with a standard reference for experimental techniques. The tutorial style description of these techniques makes the Handbook particularly suitable for use by graduate students. The Handbook will be supported by a comprehensive web site which will be updated with new data as it emerges. The Handbook has six main sections: -- Fundamentals of*

Superconductivity - characteristic properties, elementary theory, critical current of type II superconductors-- Processing - bulk materials, wires and tapes, thick and thin films, contact techniques-- Characterisation Techniques - structure/microstructure, measurement and interpretation of electromagnetic properties, measurement of physics properties-- Materials - characteristic properties of low and high T_c materials-- Applications - high current applications, trapped flux devices, high frequency devices, Josephson junction device

STUDY OF SECOND GENERATION HIGH TEMPERATURE SUPERCONDUCTORS: ELECTROMAGNETIC CHARACTERISTICS AND AC LOSS ANALYSIS

Springer Nature *This thesis introduces a systematic study on Second Generation (2G) High Temperature Superconductors (HTS), covering a novel design of an advanced medical imaging device using HTS, and an in-depth investigation on the losses of HTS. The text covers the design and simulation of a superconducting Lorentz Force Electrical Impedance Tomography. This is potentially a significant medical device that is more efficient and compact than an MRI, and is capable of detecting early cancer, as well as other pathologies such as stroke and internal haemorrhages. It also presents the information regarding the fundamental physics of superconductivity, concentrating on the AC losses in superconducting coils and tapes. Overall, the thesis signifies an important contribution to the investigation of High Temperature Superconductors. This thesis will be beneficial to the development of advanced superconducting applications in healthcare as well as more broadly in electrical and energy systems.*

SUPERCONDUCTORS

MATERIALS AND APPLICATIONS

Materials Research Forum LLC *The book presents the current status of superconductor science and technology. It focuses on the design, properties and applications of superconductor materials. The superconductor categories covered include type-I, type-II, bulk, hard, soft, oxide, fermions, organic, iron, Lanthanide-based superconductors, high temperature superconductors and superconducting metamaterials. Keywords: Superconductors, Large-Scale Applications, Bulk Superconductors, Soft Superconductors, Oxide Superconductors, Lanthanide-based Superconductors, High Temperature Superconductors, Superconducting Metamaterials, Medical Applications, Magnetic Imaging Resonance Applications.*

SUPERCONDUCTORS

PROPERTIES, TECHNOLOGY, AND APPLICATIONS

BoD - Books on Demand *Book "Superconductors - Properties, Technology, and Applications" gives an overview of major problems encountered in this field of study. Most of the material presented in this book is the result of authors' own research that has been carried out over a long period of time. A number of chapters thoroughly describe the fundamental electrical and structural properties of the superconductors as well as the methods researching those properties. The sourcebook comprehensively covers the advanced techniques and concepts of superconductivity. It's intended for a wide range of readers.*

SUPERCONDUCTING STATE

MECHANISMS AND MATERIALS

Oxford University Press *The book provides scientists with a detailed understanding of the nature of superconductivity and the most interesting superconducting materials.*

CLASSIC AND ADVANCED CERAMICS

FROM FUNDAMENTALS TO APPLICATIONS

John Wiley & Sons *Based on the author's lectures to graduate students of geosciences, physics, chemistry and materials science, this didactic handbook covers basic aspects of ceramics such as composition and structure as well as such advanced topics as achieving specific functionalities by choosing the right materials. The focus lies on the thermal transformation processes of natural raw materials to arrive at traditional structural ceramics and on the general physical principles of advanced functional ceramics. The book thus provides practice-oriented information to readers in research, development and engineering on how to understand, make and improve ceramics and derived products, while also serving as a rapid reference for the practitioner. The choice of topics and style of presentation make it equally useful for chemists, materials scientists, engineers and mineralogists.*

OPTICAL TECHNIQUES FOR SOLID-STATE MATERIALS CHARACTERIZATION

CRC Press Over the last century, numerous optical techniques have been developed to characterize materials, giving insight into their optical, electronic, magnetic, and structural properties and elucidating such diverse phenomena as high-temperature superconductivity and protein folding. *Optical Techniques for Solid-State Materials Characterization* provides detailed descriptions of basic and advanced optical techniques commonly used to study materials, from the simple to the complex. The book explains how to use these techniques to acquire, analyze, and interpret data for gaining insight into material properties. With chapters written by pioneering experts in various optical techniques, the text first provides background on light-matter interactions, semiconductors, and metals before discussing linear, time-integrated optical experiments for measuring basic material properties, such as Fourier transform infrared spectroscopy, photoluminescence, and Raman scattering. The next section begins with a description of ultrashort pulse generation and carrier dynamics in semiconductors and metals. The book then discusses time-resolved optical techniques, such as pump-probe spectroscopy, terahertz spectroscopy, and magneto-optical spectroscopy. The subsequent section describes spatially resolved optical spectroscopy, including conventional optical microscopy and micro-optical and near-field scanning techniques. The book concludes with an overview of more advanced, emerging optical techniques, such as ultrafast x-ray and electron diffraction, ultrafast photoemission spectroscopy, and time-resolved optical microscopy. As optical techniques are among the first applied when studying new systems with novel properties, the information presented in this comprehensive reference will only grow in importance. By supplying clear, detailed explanations of these techniques, the book enables researchers to readily implement them and acquire new insights into the materials they study. CRC Press Authors Speak Rohit P. Prasankumar speaks about his book. Watch the Video

REVIEWS OF ACCELERATOR SCIENCE AND TECHNOLOGY

VOLUME 5: APPLICATIONS OF SUPERCONDUCTING TECHNOLOGY TO ACCELERATORS

World Scientific Over the past several decades major advances in accelerators have resulted from breakthroughs in accelerator science and accelerator technology. After the introduction of a new accelerator physics concept or the implementation of a new technology, a leap in accelerator performance followed. A well-known representation of these advances is the Livingston chart, which shows an exponential growth of accelerator performance over the last seven or eight decades. One of the breakthrough accelerator technologies that support this exponential growth is superconducting technology. Recognizing this major technological advance, we dedicate Volume 5 of *Reviews of Accelerator Science and Technology (RAST)* to superconducting technology and its applications. Two major applications are superconducting magnets (SC magnets) and superconducting radio-frequency (SRF) cavities. SC magnets provide much higher magnetic field than their room-temperature counterparts, thus allowing accelerators to reach higher energies with comparable size as well as much reduced power consumption. SRF technology allows field energy storage for continuous wave applications and energy recovery, in addition to the advantage of tremendous power savings and better particle beam quality. In this volume, we describe both technologies and their applications. We also include discussion of the associated R&D in superconducting materials and the future prospects for these technologies. Contents: Overview of Superconductivity and Challenges in Applications (Rene Flükiger) Superconducting Materials and Conductors: Fabrication and Limiting Parameters (Luca Bottura and Arno Godeke) Superconducting Magnets for Particle Accelerators (Lucio Rossi and Luca Bottura) Superconducting Magnets for Particle Detectors and Fusion Devices (Akira Yamamoto and Thomas Taylor) Superconducting Radio-Frequency Fundamentals for Particle Accelerators (Alex Gurevich) Superconducting Radio-Frequency Systems for High- β Particle Accelerators (Sergey Belomestnykh) Superconducting Radio-Frequency Cavities for Low-Beta Particle Accelerators (Michael Kelly) Cryogenic Technology for Superconducting Accelerators (Kenji Hosoyama) Superconductivity in Medicine (Jose R Alonso and Timothy A Antaya) Industrialization of Superconducting RF Accelerator Technology (Michael Peiniger, Michael Pekeler and Hanspeter Vogel) Superconducting Radio-Frequency Technology R&D for Future Accelerator Applications (Charles E Reece and Gianluigi Ciovati) Educating and Training Accelerator Scientists and Technologists for Tomorrow (William Barletta, Swapan Chattopadhyay and Andrei Seryi) Pursuit of Accelerator Projects at KEK in Japan (Yoshitaka Kimura and Nobukazu Toge) Readership: Physicists and engineers in accelerator science and industry. Keywords: Particle Accelerators; Superconducting; Superconducting Materials; Superconducting Technology Reviews: "This latest volume looks at the role of superconductivity in particle accelerators and how this intriguing phenomenon has been harnessed in the pursuit of ever-increasing beam energy or intensity. It also considers the application of superconducting technology beyond the realm of accelerators, for example in medical scanners and fusion devices. As well as containing much technical detail it is also full of fascinating facts." CERN Courier

ORGANIC CONDUCTORS, SUPERCONDUCTORS AND MAGNETS: FROM SYNTHESIS TO MOLECULAR ELECTRONICS

Springer Science & Business Media The book covers different aspects of the chemistry and physics of molecular materials, including organic synthesis of specific organic donors and ligands, organic metals and superconductors, molecule-based magnets, multiproperty materials and organic-inorganic hybrids. The 17 chapters are written by some of the most authoritative authors in their field. The two last chapters are devoted to molecular electronics and devices, in particular the achievements and potential for applications. An excellent work for all students and researchers in organic conductors, superconductors and molecule based magnets.

AN INTRODUCTION TO THE MATHEMATICAL THEORY OF DYNAMIC MATERIALS

Springer Science & Business Media *This fascinating book is a treatise on real space-age materials. It is a mathematical treatment of a novel concept in material science that characterizes the properties of dynamic materials—that is, material substances whose properties are variable in space and time. Unlike conventional composites that are often found in nature, dynamic materials are mostly the products of modern technology developed to maintain the most effective control over dynamic processes.*

APATITES AND THEIR SYNTHETIC ANALOGUES

SYNTHESIS, STRUCTURE, PROPERTIES AND APPLICATIONS

BoD - Books on Demand *Apatite-type minerals and their synthetic analogues are of interest of many industrial branches and scientific disciplines including material sciences, chemical industry, agriculture, geology, medicine and dentistry. This book provides a basic overview of general knowledges of this topic in order to provide the comprehensive survey from a scientific and technological perspective. The book is divided into 10 chapters, which are devoted to the structure and properties of minerals from the supergroup of apatite, experimental techniques of preparation and characterization of synthetic analogues of apatite minerals, substitution in the structure of apatite as well as utilization of these materials in wide range of common and special advanced applications in industry, material sciences and research. Additionally, the phosphate rocks, their classification, geological role, mining and beneficiation of phosphate ore, production of elemental phosphorus, phosphoric acid and fertilizers are also described. Although this book is meant for chemist, material scientist and research engineers, the individual chapters contain theoretical background, historical aspects as well as examples of synthetic and analytical methods which may be also interesting for students and non-expert readers as well.*

EXPERIMENTAL TECHNIQUES FOR LOW-TEMPERATURE MEASUREMENTS

CRYOSTAT DESIGN, MATERIAL PROPERTIES AND SUPERCONDUCTOR CRITICAL-CURRENT TESTING

Oxford University Press *Publisher description*

APPLIED SUPERCONDUCTIVITY

HANDBOOK ON DEVICES AND APPLICATIONS

John Wiley & Sons *This wide-ranging presentation of applied superconductivity, from fundamentals and materials right up to the details of many applications, is an essential reference for physicists and engineers in academic research as well as in industry. Readers looking for a comprehensive overview on basic effects related to superconductivity and superconducting materials will expand their knowledge and understanding of both low and high T_c superconductors with respect to their application. Technology, preparation and characterization are covered for bulk, single crystals, thin films as well as electronic devices, wires and tapes. The main benefit of this work lies in its broad coverage of significant applications in magnets, power engineering, electronics, sensors and quantum metrology. The reader will find information on superconducting magnets for diverse applications like particle physics, fusion research, medicine, and biomagnetism as well as materials processing. SQUIDs and their usage in medicine or geophysics are thoroughly covered, as are superconducting radiation and particle detectors, aspects on superconductor digital electronics, leading readers to quantum computing and new devices.*

MAGNETOCALORIC ENERGY CONVERSION

FROM THEORY TO APPLICATIONS

Springer *This book provides the latest research on a new alternative form of technology, the magnetocaloric energy conversion. This area of research concerns magnetic refrigeration and cooling, magnetic heat pumping and magnetic power generation. The book's systematic approach offers the theoretical basis of magnetocaloric energy conversion and its various sub domains and this is supported with the practical examples. Besides these fundamentals, the book also introduces potential solutions to engineering problems in magnetocalorics and to alternative technologies of solid state energy conversion. The aim of the book is therefore to provide engineers with the most up-to-date information and also to facilitate the understanding, design and construction of future magnetocaloric energy conversion devices. The magnetocaloric energy conversion represents an alternative to compressor based refrigerators and heat pumps. It is a serious alternative to power generation with low*

enthalpy heat sources. This green technology offers an opportunity to use environmentally friendly solid refrigerants and the potentially high energy efficiency follows the trends of future energy conversion devices. This book is intended for postgraduate students and researchers of refrigeration, heat pumping, power generation alternatives, heat regenerators and advanced heat transfer mechanisms.

REVIEWS OF ACCELERATOR SCIENCE AND TECHNOLOGY

APPLICATIONS OS SUPERCONDUCTING TECHNOLOGY TO ACCELERATORS. VOL. 5

World Scientific This book is dedicated to superconducting technology and its applications, including superconducting magnets (SC magnets) and superconducting radio-frequency (SRF) cavities.

USING THE ENGINEERING LITERATURE, SECOND EDITION

CRC Press With the encroachment of the Internet into nearly all aspects of work and life, it seems as though information is everywhere. However, there is information and then there is correct, appropriate, and timely information. While we might love being able to turn to Wikipedia® for encyclopedia-like information or search Google® for the thousands of links on a topic, engineers need the best information, information that is evaluated, up-to-date, and complete. Accurate, vetted information is necessary when building new skyscrapers or developing new prosthetics for returning military veterans While the award-winning first edition of Using the Engineering Literature used a roadmap analogy, we now need a three-dimensional analysis reflecting the complex and dynamic nature of research in the information age. Using the Engineering Literature, Second Edition provides a guide to the wide range of resources available in all fields of engineering. This second edition has been thoroughly revised and features new sections on nanotechnology as well as green engineering. The information age has greatly impacted the way engineers find information. Engineers have an effect, directly and indirectly, on almost all aspects of our lives, and it is vital that they find the right information at the right time to create better products and processes. Comprehensive and up to date, with expert chapter authors, this book fills a gap in the literature, providing critical information in a user-friendly format.

BERKSHIRE ENCYCLOPEDIA OF SUSTAINABILITY 4/10

NATURAL RESOURCES AND SUSTAINABILITY

Berkshire Publishing Group Natural Resources and Sustainability explores how human needs and desires, from sustenance and shelter to recreation and travel, have spurred the consumption of Earth's material resources. Scientists, ecologists, and other expert authors present the historical impact of commercial activities (in industries as varied as fisheries, agriculture, energy, and mineral extraction), discuss the global distribution and use of renewable and nonrenewable resources, and focus on innovative approaches for the future. Readers will learn why renewal doesn't necessarily put a resource beyond harm and why the no-free-lunch adage applies to all natural resources.

THE NEW WALFORD

GUIDE TO REFERENCE RESOURCES

Library Assn Pub Limited Part of a three-volume cycle, this book presents a selection of key resources - accessible via the web and in print. Resources within the 12 groupings are divided between 100 generally recognizable subject fields, and then allocated to one of 13 standard resource categories. It is intended for LIS professionals, research workers and students.

NEUTRONS AND SYNCHROTRON RADIATION IN ENGINEERING MATERIALS SCIENCE

FROM FUNDAMENTALS TO MATERIAL AND COMPONENT CHARACTERIZATION

John Wiley & Sons Besides its coverage of the four important aspects of synchrotron sources, materials and material processes, measuring techniques, and applications, this ready reference presents both important method types: diffraction and tomography. Following an introduction, a general section leads on to methods, while further sections are devoted to emerging methods and industrial applications. In this way, the text provides new users of large-scale facilities with easy access to an understanding of both the methods and opportunities offered by different sources and instruments.

JOURNAL OF RESEARCH OF THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

MICROPOROUS MEDIA

SYNTHESIS, PROPERTIES, AND MODELING

CRC Press *Microporous Media* presents new developments from nearly a decade of advancement. Written by a leading researcher in the field, this reference provides examples of the most original scientific and technical research impacting studies in porosity and microporosity, and illustrates methods to forecast the properties of microporous structures for improved electronic, construction, electrical, chemical, and medical applications. The book outlines new results in fractal, self-organization, and polymer theories; pore aging, and percolation; and their various engineering applications, and considers the impact of preparation conditions on the structure and properties of microporous materials.

MAGNETIC SENSORS AND MAGNETOMETERS, SECOND EDITION

Artech House This completely updated second edition of an Artech House classic covers industrial applications and space and biomedical applications of magnetic sensors and magnetometers. With the advancement of smart grids, renewable energy resources, and electric vehicles, the importance of electric current sensors increased, and the book has been updated to reflect these changes. Integrated fluxgate single-chip magnetometers are presented. GMR sensors in the automotive market, especially for end-of-shaft angular sensors, are included, as well as Linear TMR sensors. Vertical Hall sensors and sensors with integrated ferromagnetic concentrators are two competing technologies, which both brought 3-axial single-chip Hall ICs, are considered. Digital fluxgate magnetometers for both satellite and ground-based applications are discussed. All-optical resonant magnetometers, based on the Coherent Population Trapping effect, has reached approval in space, and is covered in this new edition of the book. Whether you're an expert or new to the field, this unique resource offers you a thorough overview of the principles and design of magnetic sensors and magnetometers, as well as guidance in applying specific devices in the real world. The book covers both multi-channel and gradiometric magnetometer systems, special problems such as cross-talk and crossfield sensitivity, and comparisons between different sensors and magnetometers with respect to various application areas. Miniaturization and the use of new materials in magnetic sensors are also discussed. A comprehensive list of references to journal articles, books, proceedings and webpages helps you find additional information quickly.

SUPERCONDUCTIVITY

Anshan Pub Superconductivity is a striking phenomenon that has attracted the attention of physicists, chemists, material scientists, engineers, and also the non-technical public. The discovery of high-Tc cuprates opened up a new class of materials in this field. This significant and exciting discovery has posed two new problems: of making High-Tc materials available to technology at room temperature on one hand and of exploring the possible mechanism of High-Tc superconductivity on the other. The beginning of the 21st century sees superconductor applications reaching important milestones. Superconductors now make possible the most advanced experiments in chemistry, biochemistry, particle physics and health sciences. Superconductors are also becoming part of the fabric of modern-day life. This outstanding and invaluable volume has been very systematically structured and organised covering all aspects of superconductivity. The first five chapters deal with basic principles and microscopic weak coupling BCS theory of superconductivity. Chapters 6 to 8 are devoted to high-Tc cuprates covering experimental results and theories. Chapter 9 is diverted to new emerging superconductors and the last chapter describes the potential applications of superconductors.

CHIMERA STATES IN COMPLEX NETWORKS

Frontiers Media SA

SUPERCONDUCTIVITY AND MAGNETISM IN SKUTTERUDITES

CRC Press *Superconductivity and Magnetism in Skutterudites* discusses superconducting and magnetic properties of a class of materials called skutterudites. With a brief introduction of the fundamental structural features of skutterudites, the book then provides a detailed assessment of the superconducting and magnetic properties, focusing particularly on the rare earth-filled skutterudites where a plethora of fascinating properties and ground states is realized due to interactions of the filler species with the framework ions. Such interactions underpin the exciting forms of superconductivity and magnetism, most notably realized in the exotic heavy fermion superconductor of composition PrOs₄Sb₁₂. The two main topics of superconductivity and magnetism are provided with a concise introduction of superconducting and magnetic properties so that a reader can appreciate and understand the main arguments in the text. This book would appeal to graduate students, postdoctoral students, and anyone interested in superconducting and magnetic properties of a large family of minerals called skutterudites. Key Features: - Gives a thorough account of the superconducting and magnetic properties

of skutterudites. - Each topic is accompanied by introductory sections to assist in the understanding of the text. - Supported by numerous figures and all key references.

MOTOR DESIGN FOR MAXIMUM MATERIAL EXPLOITATION AND MAGNETIZATION PROCEDURE WITH IN-LINE QUALITY CHECK FOR MASS PRODUCTION

Universitätsverlag der TU Berlin To reduce the amount of Rare-earth Elements in high efficient permanent magnet electric motors, the magnetic stray flux has to be reduced. Additionally, a temperature reduction inside the motor reduces the necessary amount of the so called Heavy Rare-earth Elements, which account for the bulk part of the magnet material costs. In this thesis a permanent magnet motor in wet rotor configuration for an automotive application is designed. It was shown that by simple thermal improvements of the electric insulation system the maximum temperature of the stator can be reduced. Extensive measurements on different combinations of insulation material of the stator and the development of a new thermal model for orthocyclic wound stators were performed. Due to the use of fiber cans eddy current losses could be eliminated and the stray flux minimized. In a second stage a magnetizing fixture was build up, which is able to magnetize the buried magnets inside the rotor. The rotor and the magnetizing fixture was developed, so that the magnets can be optimal magnetized. To check the quality of the magnets the magnetizing coil was developed in a way, such that the hysteresis curve of every single magnet during magnetization can be measured. Different magnets were tested and ways to calculate parasitics are given. Um die Menge an Selten Erden in hoch-effizienten permanent erregten Elektromotoren zu reduzieren, muss der magnetische Streufluss verringert werden. Eine Temperaturreduktion im Motor verringert zudem die nötige Menge an so genannten schweren Selten Erden, welche einen Großteil der Kosten der Magnetmaterialien ausmachen. In dieser Arbeit wird dazu ein permanent erregter Nassläufer für eine automotiv Anwendung ausgelegt. Es konnte gezeigt werden, dass durch einfache Maßnahmen im Bereich der elektrischen Isolation die maximale Temperatur im Stator reduziert werden konnte. Umfangreiche Messungen an verschiedenen Kombinationen von elektrischen Isolationen des Stators und die Entwicklung eines neuen thermischen Modells für orthozyklisch gewickelte Statoren wurden getätigt. Durch Einsatz von Spaltrohren aus Faserverbundwerkstoffen konnten die Wirbelstromverluste beseitigt werden und der Streufluss minimiert werden. In einem zweiten Schritt wurde eine Magnetisiervorrichtung aufgebaut, mit der die zu Anfang unmagnetisierten eingebetteten Magneten im Rotor aufmagnetisiert werden konnten. Der Rotor wurde zudem zusammen mit der Magnetisierungsspule so ausgelegt, dass die Magnete optimal magnetisiert werden können. Um die Qualität der Magnete zu testen wurde die Magnetisierungsspule zudem so ausgelegt, dass eine Messung der Hystereseurve jedes einzelnen Magneten während der Magnetisierung möglich ist. Verschiedene Magnete wurden vermessen und Möglichkeiten zur Bestimmung von parasitären Effekten gegeben.

RESEARCH AND TECHNOLOGY DEVELOPMENT ON SUPERCONDUCTING CURRENT LIMITING TRANSFORMERS

KIT Scientific Publishing

HANDBOOK OF SUPERCONDUCTIVITY

PROCESSING AND CRYOGENICS, VOLUME TWO

CRC Press This is the second of three volumes of the extensively revised and updated second edition of the Handbook of Superconductivity. The past twenty years have seen rapid progress in superconducting materials, which exhibit one of the most remarkable physical states of matter ever to be discovered. Superconductivity brings quantum mechanics to the scale of the everyday world where a single, coherent quantum state may extend over a distance of metres, or even kilometres, depending on the size of a coil or length of superconducting wire. Viable applications of superconductors rely fundamentally on an understanding of this intriguing phenomena and the availability of a range of materials with bespoke properties to meet practical needs. While the first volume covers the fundamentals of superconductivity and the various classes of superconducting materials, Volume 2 covers processing of the desired superconducting materials into desired forms: bulks, films, wires and junction-based devices. The volume closes with articles on the refrigeration methods needed to put the materials into the superconducting state. Key Features: Covers the depth and breadth of the field Includes contributions from leading academics and industry professionals across the world Provides hands-on guidance to the manufacturing and processing technologies A comprehensive reference, the handbook is suitable for both graduate students and practitioners in experimental physics, materials science, and multiple engineering disciplines, including electronic and electrical, chemical, mechanical, metallurgy and others.

APPLIED SUPERCONDUCTIVITY 2003

PROCEEDINGS OF THE 6TH EUROPEAN CONFERENCE ON APPLIED SUPERCONDUCTIVITY, SORRENTO, ITALY, 14-18 SEPTEMBER 2003

CRC Press According to its tradition, the EUCAS Conference focused on the role of superconductivity in bridging various aspects of research with a variety of concrete advanced applications. The wide interactions among scientists operating worldwide in the field of superconductivity and the sharing of their knowledge and experience represented the main result of the event. The EUCAS Conference has been an ideal forum for presentation and discussion of recent developments in the field of applied superconductivity in the area of power and electronic applications. Great emphasis has been given to

materials research directly connected to such applications. For this conference, 515 plenary, invited, and contributed papers were accepted, covering different areas of applications that strongly benefit from the use of superconductivity, such as energy transportation, large magnet systems, biomedical instrumentation, digital electronics, wireless communications, and quantum computing. Forty-two plenary and invited papers are included in *Applied Superconductivity 2003*, along with a CD-ROM that contains PDF files of all the contributed papers linked from contents lists (and, for completeness, plenary and invited papers). These proceedings are addressed to international physicists, electrotechnical and electronic engineers, material scientists, and chemists interested in the most recent and exciting advances in the field of applied superconductivity.

POLYMERS IN ORGANIC ELECTRONICS

POLYMER SELECTION FOR ELECTRONIC, MECHATRONIC, AND OPTOELECTRONIC SYSTEMS

Elsevier *Polymers in Organic Electronics: Polymer Selection for Electronic, Mechatronic, and Optoelectronic Systems* provides readers with vital data, guidelines, and techniques for optimally designing organic electronic systems using novel polymers. The book classifies polymer families, types, complexes, composites, nanocomposites, compounds, and small molecules while also providing an introduction to the fundamental principles of polymers and electronics. Features information on concepts and optimized types of electronics and a classification system of electronic polymers, including piezoelectric and pyroelectric, optoelectronic, mechatronic, organic electronic complexes, and more. The book is designed to help readers select the optimized material for structuring their organic electronic system. Chapters discuss the most common properties of electronic polymers, methods of optimization, and polymeric-structured printed circuit boards. The polymeric structures of optoelectronics and photonics are covered and the book concludes with a chapter emphasizing the importance of polymeric structures for packaging of electronic devices. Provides key identifying details on a range of polymers, micro-polymers, nano-polymers, resins, hydrocarbons, and oligomers Covers the most common electrical, electronic, and optical properties of electronic polymers Describes the underlying theories on the mechanics of polymer conductivity Discusses polymeric structured printed circuit boards, including their rapid prototyping and optimizing their polymeric structures Shows optimization methods for both polymeric structures of organic active electronic components and organic passive electronic components

SPRINGER HANDBOOK OF MECHANICAL ENGINEERING

Springer Nature This resource covers all areas of interest for the practicing engineer as well as for the student at various levels and educational institutions. It features the work of authors from all over the world who have contributed their expertise and support the globally working engineer in finding a solution for today's mechanical engineering problems. Each subject is discussed in detail and supported by numerous figures and tables.

INTRODUCTION TO THE PHYSICS AND CHEMISTRY OF MATERIALS

CRC Press *Discusses the Structure and Properties of Materials and How These Materials Are Used in Diverse Applications* Building on undergraduate students' backgrounds in mathematics, science, and engineering, *Introduction to the Physics and Chemistry of Materials* provides the foundation needed for more advanced work in materials science. Ideal for a two-semester course, the text focuses on chemical bonding, crystal structure, mechanical properties, phase transformations, and materials processing for the first semester. The material for the second semester covers thermal, electronic, photonic, optical, and magnetic properties of materials. Requiring no prior experience in modern physics and quantum mechanics, the book introduces quantum concepts and wave mechanics through a simple derivation of the Schrödinger equation, the electron-in-a-box problem, and the wave functions of the hydrogen atom. The author also presents a historical perspective on the development of the materials science field. He discusses the Bose-Einstein, Maxwell-Boltzmann, Planck, and Fermi-Dirac distribution functions, before moving on to the various properties and applications of materials. With detailed derivations of important equations, this applications-oriented text examines the structure and properties of materials, such as heavy metal glasses and superconductors. It also explores recent developments in organics electronics, polymer light-emitting diodes, superconductivity, and more.

HANDBOOK OF SUPERCONDUCTIVITY

FUNDAMENTALS AND MATERIALS, VOLUME ONE

CRC Press This is the first of three volumes of the extensively revised and updated second edition of the *Handbook of Superconductivity*. The past twenty years have seen rapid progress in superconducting materials, which exhibit one of the most remarkable physical states of matter ever to be discovered. Superconductivity brings quantum mechanics to the scale of the everyday world where a single, coherent quantum state may extend over a distance of metres, or even kilometres, depending on the size of a coil or length of superconducting wire. Viable applications of superconductors rely fundamentally on an understanding of this intriguing phenomena and the availability of a range of materials with bespoke properties to meet practical needs. This first volume covers the fundamentals

of superconductivity and the various classes of superconducting materials, which sets the context and background for Volumes 2 and 3. Key Features: Covers the depth and breadth of the field Includes contributions from leading academics and industry professionals across the world Provides hands-on guidance to the manufacturing and processing technologies A comprehensive reference, this handbook is suitable for both graduate students and practitioners in experimental physics, materials science and multiple engineering disciplines, including electronic and electrical, chemical, mechanical, metallurgy and others.

ADVANCED MATERIALS FOR ELECTROMAGNETIC SHIELDING

FUNDAMENTALS, PROPERTIES, AND APPLICATIONS

John Wiley & Sons A comprehensive review of the field of materials that shield people and sensitive electronic devices from electromagnetic fields *Advanced Materials for Electromagnetic Shielding* offers a thorough review of the most recent advances in the processing and characterization of the electromagnetic shielding materials. In this groundbreaking book, the authors—*noted experts in the field*—discuss the fundamentals of shielding theory as well as the practice of electromagnetic field measuring techniques and systems. They also explore applications of shielding materials used as absorbers of electromagnetic radiation, or as magnetic shields and explore coverage of new advanced materials for EMI shielding in aerospace applications. In addition, the text contains methods of preparation and applicability of metal foams. This comprehensive text examines the influence of technology on the micro- and macrostructure of polymers enabling their use in screening technology, technologies of shielding materials based on textiles, and analyses of its effectiveness in screening. The book also details the method of producing nanowires and their applications in EM shielding. This important resource: Explores the burgeoning market of electromagnetic shielding materials as we create, depend upon, and are exposed to more electronic devices than ever Addresses the most comprehensive issues relating to electromagnetic fields Contains information on the manufacturing, characterization methods, and properties of materials used to protect against them Discusses the important characterization techniques compared with one another, thus allowing scientists to select the best approach to a problem Written for materials scientists, electrical and electronics engineers, physicists, and industrial researchers, *Advanced Materials for Electromagnetic Shielding* explores all aspects in the area of electromagnetic shielding materials and examines the current state-of-the-art and new challenges in this rapidly growing area.

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