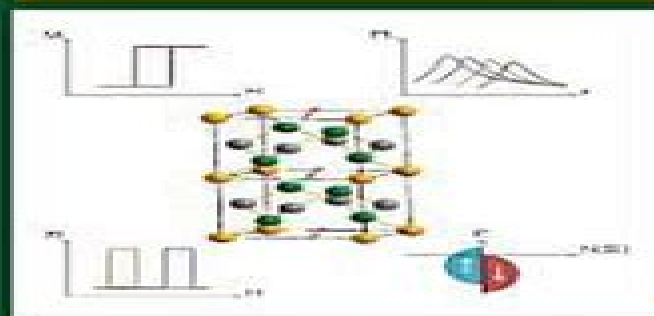




Rare Earth and Transition Metal Doping of Semiconductor Materials: Synthesis, Magnetic Properties and Room Temperature Spintronics

Edited by V. Dierolf, I. Ferguson and J. M. Zavada

Magnetic Properties Of Rare Earth And Transition Metal

David Clifford Douglass



Magnetic Properties Of Rare Earth And Transition Metal:

Magnetic Properties of Rare Earth and Transition Metal Multilayers Prabhath Sudarshana Perera,1995 Theory of the Magnetic Properties of Rare Earth - Transition Metal Alloys Barbara Szpunar,1978 **Magnetic Properties of Rare Earth Metals** R. Elliott,2013-06-09 The rare earths have a unique place among the elements Although very much alike chemically and in most physical properties they each have very different and striking magnetic properties The reason of course lies in their 4f electrons which determine the magnetic properties but have little effect on other chemical and physical behaviour Although they are not rare some indeed are among the more common heavy elements in the earth's crust the difficulty of separation has meant that their intricate magnetic properties have only recently been unravelled Now however the general pattern of their magnetism is well charted and the underlying theory is well understood Both are thoroughly summarised in this book It provides an excellent example of the kind of extensive synthesis which is possible with modern solid state physics it represents only a high plateau in the ascent to complete understanding But It will become clear to the reader that while the overall position is satisfactory there are many details still to be elucidated experimentally and much to be done theoretically before all the underlying forces are identified and estimated from a priori calculations It is hoped that the book will provide a useful stimulus in this direction It should also be of use to those who are interested in related disciplines for example the rare earth compounds or the transition metals In addition rare earths promise to be important technologically as alloy constituents Handbook of Magnetic Materials K.H.J. Buschow,2002-09-20 Magnetoelectronics is a novel and rapidly developing field This new field is frequently referred to as spin electronics or spintronics It includes spin utilizing devices that need neither a magnetic field nor magnetic materials In semiconductor devices the spin of the carriers has only played a very modest role so far because well established semiconductor devices are non magnetic and show only negligible effects of spin Nanoscale thin films and multilayers nanocrystalline magnetic materials granular films and amorphous alloys have attracted much attention in the last few decades in the field of basic research as well as in the broader field of materials science Such heterogeneous materials display uncommon magnetic properties that virtually do not occur in bulk materials This is true in particular with respect to surface interface magnetic anisotropy and surface interface magnetostrictive strains and giant magnetoresistance The local atomic arrangement at the interface differs strongly from that in the bulk The local symmetry is lowered so that some interactions are changed or are missing altogether The interface atoms may be envisaged as forming a new phase and some properties characteristic of this phase may become predominant for the entire system This becomes particularly evident in the case of interfacial magnetostriction which can lead to a decrease almost to zero or to an increase over the bulk value of the resulting magnetostriction of the nanoscale system There are various forms of the interplay of magnetism and superconductivity which can be divided into competition and coexistence phenomena For instance a strong competition is found in high T_c cuprates In these materials depending on the doping rate

either Neel type antiferromagnetism moments e g from 4f elements with superconductivity is known to occur in systems where the concentration of these moments is sufficiently small or where they are antiferromagnetically ordered and only weakly coupled to the conduction electrons During the years intermetallic gadolinium compounds have adopted a special position in the study of 4f electron magnetism The reason for this is the fact that the gadolinium moment consists only of a pure spin moment orbital contributions to the moment being absent As a consequence gadolinium compounds have been regarded as ideal test benches for studying exchange interactions free from complications due to crystal effects Volume 14 of the Handbook of Magnetic Materials as the preceding volumes has a dual purpose As a textbook it is intended to be of assistance to those who wish to be introduced to a given topic in the field of magnetism without the need to read the vast amount of literature published As a work of reference it is intended for scientists active in magnetism research To this dual purpose volume 14 of the Handbook is composed of topical review articles written by leading authorities In each of these articles an extensive description is given in graphical as well as tabular form much emphasis being placed on the discussion of the experimental material in the framework of physics chemistry and material science

Magnetic Properties of Rare Earth-transition Metal Compositionally-modulated Films Zhengsheng Shan,1990 **Nuclear Science Abstracts**,1976 *Materials Sciences Programs* United States. Department of Energy. Division of Materials Sciences,1989

Rare-earth Iron Permanent Magnets J. M. D. Coey,1996 Rare earth iron permanent magnets combine the magnetization of iron or cobalt with the anisotropy of a light rare earth in intermetallic compounds which exhibit nearly ideal hysteresis The rare earth iron magnets are now indispensable components of a vast range of electronic and electromechanical devices This book covers the principles of permanent magnetism magnet processing and applications in a series of interlocking chapters written by experts in each area Born of experience of the Concerted European Action on Magnets it is a definitive account of the field designed to be read by physicists materials scientists and electrical engineers

Handbook of Magnetic Materials ,2025-11-01 Handbook of Magnetic Materials Volume 34 highlights new advances in the field with this new volume presenting interesting chapters on a variety of timely and field specific topics with each contributed to by an international board of authors Provides the authority and expertise of leading contributors from an international board of authors Presents the latest release in the Handbook of Magnetic Materials series Highlights new and timely advances in the field

Handbook of Magnetic Materials Ekkes H. Brück,2023-10-19 Handbook of Magnetic Materials Volume 32 highlights new advances in the field with this new volume presenting interesting chapters on a variety of timely and field specific topics each contributed to by an international board of authors Provides the authority and expertise of leading contributors from an international board of authors Presents the latest release in the Handbook of Magnetic Materials

Scientific and Technical Aerospace Reports ,1973 Lists citations with abstracts for aerospace related reports obtained from world wide sources and announces documents that have recently been entered into the NASA

Scientific and Technical Information Database **Concise Encyclopedia of Magnetic and Superconducting Materials**
 K.H.J. Buschow, 2005-12-28 Magnetic and superconducting materials pervade every avenue of the technological world from microelectronics and mass data storage to medicine and heavy engineering Both areas have experienced a recent revitalisation of interest due to the discovery of new materials and the re evaluation of a wide range of basic mechanisms and phenomena This Concise Encyclopedia draws its material from the award winning Encyclopedia of Materials and Engineering and includes updates and revisions not available in the original set making it the ideal reference companion for materials scientists and engineers with an interest in magnetic and superconducting materials Contains in excess of 130 articles taken from the award winning Encyclopedia of Materials Science and Technology including ScienceDirect updates not available in the original set Each article discusses one aspect of magnetic and superconducting materials and includes photographs line drawings and tables to aid the understanding of the topic at hand Cross referencing guides readers to articles covering subjects of related interest **Bibliography** Pierre Villars, Karin Cenxual, Marinella Penzo, 2012-12-21 By browsing about 10 000 000 scientific articles of over 200 major journals mainly in a cover to cover approach some 200 000 publications were selected The extracted data is part of the following fundamental material research fields crystal structures S phase diagrams also called constitution C and the comprehensive field of intrinsic physical properties P This work has been done systematically starting with the literature going back to 1900 The above mentioned research field codes S C P as well as the chemical systems investigated in each publication were included in the present work The aim of the Inorganic Substances Bibliography is to provide researchers with a comprehensive compilation of all up to now published scientific publications on inorganic systems in only three handy volumes **Rare Earths** Paul Caro, 1998 **Magnetic Properties and Electronic Structure of Rare-earth-transition Metal Inter-metallic Compounds** Antônio Augusto Gomes, Arquimedes Pereira Guimarães, 1972 *The Rare Earth Elements* David A. Atwood, 2013-02-19 Lanthanides are of great importance for the electronic industries this new book from the EIBC Book Series provides a comprehensive coverage of the basic chemistry particularly inorganic chemistry of the lanthanoid elements those having a 4f shell of electrons A chapter is describing the similarity of the Group 3 elements Sc Y La the group from which the lanthanoids originate and the group 13 elements particularly aluminum having similar properties Inclusion of the group 3 and 13 elements demonstrates how the lanthanoid elements relate to other more common elements in the Periodic Table Beginning chapters describe the occurrence and mineralogy of the elements with a focus on structural features observed in compounds described in later chapters The majority of the chapters is organized by the oxidation state of the elements Ln 0 Ln II Ln III and Ln IV Within this organization the chapters are further distinguished by type of compound inorganic oxides and hydroxides aqueous speciation halides alkoxides amides and thiolates and chelates and organometallic Concluding chapters deal with diverse and critically important applications of the lanthanoids in electronic and magnetic materials and medical imaging **Principles of Vapor**

Deposition of Thin Films Professor K.S. K.S Sree Harsha, 2005-12-16 The goal of producing devices that are smaller faster more functional reproducible reliable and economical has given thin film processing a unique role in technology Principles of Vapor Deposition of Thin Films brings in to one place a diverse amount of scientific background that is considered essential to become knowledgeable in thin film deposition techniques Its ultimate goal as a reference is to provide the foundation upon which thin film science and technological innovation are possible Offers detailed derivation of important formulae Thoroughly covers the basic principles of materials science that are important to any thin film preparation Careful attention to terminologies concepts and definitions as well as abundance of illustrations offer clear support for the text **Simple**

Models of Magnetism Ralph Skomski, 2008-01-18 For hundreds of years models of magnetism have been pivotal in the understanding and advancement of science and technology from the Earth's interpretation as a magnetic dipole to quantum mechanics statistical physics and modern nanotechnology This book is the first to envision the field of magnetism in its entirety It complements a rich literature on specific models of magnetism and provides an introduction to simple models including some simple limits of complicated models The book is written in an easily accessible style with a limited amount of mathematics and covers a wide range of quantum mechanical finite temperature micromagnetic and dynamical models It deals not only with basic magnetic quantities such as moment Curie temperature anisotropy and coercivity but also with modern areas such as nanomagnetism and spintronics and with exotic themes as exemplified by the polymer analogy of magnetic phase transitions Throughout the book a sharp line is drawn between simple and simplistic models and much space is devoted to discuss the merits and failures of the individual model approaches **Xitǔ-guòdù Jīnshǔ Huàhé Wù Jí Qí**

Jiànxì Xiāng de Cíxìng Liu (Jia Ping, Jia Ping.), 1994 Interstitial Intermetallic Alloys F. Grandjean, G.J Long, K.H.J Buschow, 2012-12-06 It is well known that the density of molecular hydrogen can be increased by compression and or cooling the ultimate limit in density being that of liquid hydrogen It is less well known that hydrogen densities of twice that of liquid hydrogen can be obtained by intercalating hydrogen gas into metals The explanation of this unusual paradox is that the absorption of molecular hydrogen which in TiFe and LaNi₅ is reversible and occurs at ambient temperature and pressure involves the formation of hydrogen atoms at the surface of a metal The adsorbed hydrogen atom then donates its electron to the metal conduction band and migrates into the metal as the much smaller proton These protons are easily accommodated in interstitial sites in the metal lattice and the resulting metal hydrides can be thought of as compounds formed by the reaction of hydrogen with metals alloys and intermetallic compounds The practical applications of metal hydrides span a wide range of technologies a range which may be subdivided on the basis of the hydride property on which the application is based The capacity of the metal hydrides for hydrogen absorption is the basis for batteries as well as for hydrogen storage gettering and purification The temperature pressure characteristics of metal hydrides are the basis for hydrogen compressors sensors and actuators The latent heat of the hydride formation is the basis for heat storage heat pumps and refrigerators

Magnetic Properties Of Rare Earth And Transition Metal Book Review: Unveiling the Power of Words

In a global driven by information and connectivity, the ability of words has be more evident than ever. They have the capacity to inspire, provoke, and ignite change. Such may be the essence of the book **Magnetic Properties Of Rare Earth And Transition Metal**, a literary masterpiece that delves deep to the significance of words and their impact on our lives. Published by a renowned author, this captivating work takes readers on a transformative journey, unraveling the secrets and potential behind every word. In this review, we will explore the book is key themes, examine its writing style, and analyze its overall effect on readers.

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