ANISOTROPY AND MICROSTRUCTURE OF HIGH-COERCIVITY RARE EARTH PERMANENT MAGNETS

FINAL TECHNICAL REPORT

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by

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Anisotropy And Microstructure Of High Coercivity Rare Earth Iron Permanent Magnets

David Kirk

Anisotropy And Microstructure Of High Coercivity Rare Earth Iron Permanent Magnets:

Anisotropy and Microstructure of High-Coercivity Rare Earth Iron Permanent Magnets ,1989 In Nd2 Fe14 B based permanent magnets the coercivity is in practice only 20 40 % of the theoretical limits The aim of this study is to investigate Nd Fe B based compounds with respect to their magnetic anisotropy behaviour and to characterize the microstructure of sintered Nd Fe B based permanent magnets The anisotropy field HA was determined by using the Singular Point Detection SPD technique and the microstructural investigations were carried out on a JEOL 200 CS analytical transmission electron microscope equipped with a high take off energy dispersive EDS X ray analyzer Keywords Magnetic anisotropy Anisotropy field pulsed field technique Microstructure electron microscopy intrinsic coercive force Nd Fe B permanent magnets *Anisotropy and Microstructure of High Coercivity Rare Earth Iron Permanent Magnets, List of Papers Published* TECHNISCHE UNIV VIENNA (Austria) INST OF APPLIED AND TECHNICAL PHYSICS.,1989 Partial Contents Temperature Dependence of Anisotropy Fields and Initial Susceptibility in R2Fe14B Compounds Magnetic and Anisotropy Studies of Nd Fe B Based Permanent Magnets The Hard Magnetic Properties of Sintered Nd Fe B Permanent Magnets Magnetic Phase Transitions and Magnetic Anisotropy in Nd2Fe 14 x Co x B Compounds Investigation of the Hysteresis Loop and the Magnetic Anisotropy of Nd Fe B Based Permanent Magnets Does a Co Substitution Really Improve the Temperature Dependence of Nd Fe B Based Permanent Magnets Magnetic Anisotropy in the System La2Fe 14 x Co x B and its Relation to the System Nd2Fe 14 x Co x B The Effect of Substitution of Al on the Magnetic Properties of Nd15Fe78B7 Permanent Magnets Electron Microscope Study of Precipitation in a Niobium Containing Nd Dy Fe B Sintered Magnet Microstructural Evidence for the Magnetic Surface Hardening of Dy203 Doped N15Fe77B8 Magnets Magnetic Anisotropy in Pr2 Fe 1 x COx 14B Compounds Anisotropy and Hysteresis Studies of Highly Substituted Nd Fe B Based Permanent Magnets Electron Microscopy of Nd Fe B Based Magnets and The Influence of Dopants on Microstructure and Coercivity of Nd Fe B Sintered Magnets jhd **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

Rare Earth Permanent-Magnet Alloys' High Temperature Phase Transformation Shuming Pan,2014-12-01 The process of high temperature phase transition of rare earth permanent magnet alloys is revealed by photographs taken by high voltage TEM The relationship between the formation of nanocrystal and magnetic properties is discussed in detail which effects alloys composition and preparation process The experiment results verified some presumptions and were valuable for

subsequent scientific research and creating new permanent magnet alloys The publication is intended for researchers engineers and managers in the field of material science metallurgy and physics Prof Shuming Pan is senior engineer of Beijing General Research Institute of Non ferrous Metal Scientific and Technical Aerospace Reports ,1991 **Magnetic Domains** Alex Hubert,Rudolf Schäfer,2008-10-10 This book offers systematic and up to date treatment of the whole area of magnetic domains It contains many contributions that have not been published before The comprehensive survey of this important area gives a good introduction to students and is also interesting to researchers **Basics of Thermodynamics and Phase Transitions in Complex Intermetallics** Esther Belin-Ferre,2008 Complex metal alloys CMAs comprise a huge group of largely unknown alloys and compounds where many phases are formed with crystal structures based on giant unit cells containing atom clusters ranging from tens of to more than thousand atoms per unit cell In these phases for many phenomena the physical length scales are substantially smaller than the unit cell dimension Hence these materials offer unique combinations of properties which are mutually exclusive in conventional materials such as metallic electric conductivity combined with low thermal conductivity good light absorption with high temperature stability high metallic hardness with reduced wetting by liquids etc This book is the first of a series of books issued yearly as a deliverable to the European Community of the School established within the European Network of Excellence CMA Written by reputed experts in the fields of metal physics surface physics surface chemistry metallurgy and process engineering this book brings together expertise found inside as well as outside the network to provide a comprehensive overview of the current state of knowledge in CMAs **New Frontiers in Rare Earth Science and Applications** Xu Guangxian,Xiao Jimei,2013-10-22 New Frontiers in Rare Earth Science and Applications Volume II documents the proceedings of the International Conference on Rare Earth Development and Applications held in Beijing on September 10 14 1985 This compilation discusses quenching and sensitization of rare earth luminescence magnetic properties of rare earth intermetallics and microcapsulated rare earth nickel hydride forming materials The effect of rare earth on the quality and properties of hot rolled steel strips and role of yttrium in heavy section spheroidal graphite cast iron are also elaborated This book likewise covers the application of scandium oxide in an electron emission material and study on the effect of rare earth elements on the yield of wheat This publication is beneficial to researchers and scientists conducting work in the field of earth science **Technical Reports Awareness Circular : TRAC.** ,1989-12 Advances in Imaging and Electron Physics Peter W. Hawkes,2011-07-29 Advances in Imaging and Electron Physics merges two long running serials Advances in Electronics and Electron Physics and Advances in Optical and Electron Microscopy This series features extended articles on the physics of electron devices especially semiconductor devices particle optics at high and low energies microlithography image science and digital image processing electromagnetic wave propagation electron microscopy and the computing methods used in all these domains Includes grey systems and grey information Discusses Phase diversity Recent developments in the imaging of magnetic

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Table of Contents Anisotropy And Microstructure Of High Coercivity Rare Earth Iron Permanent Magnets

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