Bismuth-Containing Compounds

Contents

Fields of interest
Optical and Electronic Materials; Optics, Optoelectronics, Plasmonics and Optical Devices; Nanotechnology and Microengineering

Target groups
Research

Product category
Monograph

Due October 2013

* € (D) 139,09 | € (A) 142,99 | sFr 173,50
* € 129,99 | £117.00

Due October 2013

2014. X, 410 p. 239 illus., 122 in color. (Springer Series in Materials Science, Volume 186) Hardcover
* € (D) 139,09 | € (A) 142,99 | sFr 177,00
* € 129,99 | £119.50
H. Nakajima, The Wakasa Wan Energy Research Center, Tsuruga, Japan

**Porous Metals with Directional Pores**

This book reviews the recent development of fabrication methods and various properties of lotus-type porous metals and their applications. The nucleation and growth mechanism of the directional pores in metals are discussed in comparison with a model experiment of carbon dioxide pores in ice.

**Features**
- New attractive fabrication techniques are developed using simple solidification of molten metals dissolving gas
- Various features of lotus-type porous metals are resulted from pore anisotropy and cylindrical pores, which never appear in isotropic porous metals
- Various applications are considered from utilizing unique mechanical and physical properties

**Contents**
Introduction.- Various fabrication methods of cellular metals and foamed metals.- Materials definitions.- Fabrication methods of porous metals with directional pores.- Nucleation and growth mechanism of pores in metals.- Control of pore size and porosity in lotus-type porous metals.- Details of fabrication techniques of various lotus metals and alloys, intermetallic compounds, semiconductors and ceramics.- Mechanical properties of lotus metals and alloys.- Various physical and chemical properties of lotus metals and alloys.- Processing of lotus metals.- Various applications of lotus metals.- Summary

**Fields of Interest**
Metallic Materials; Nanotechnology and Micro-engineering; Characterization and Evaluation of Materials

**Target groups**
Research

**Product category**
Monograph

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W. J. Ooij, University of Cincinnati Dept. Chemical & Materials Engineering, Cincinnati, OH, USA

**Silanes for Corrosion Control of Metals**

Silanes for corrosion of metals covers the emerging applications of silanes for use in the corrosion protection of metals. The role of silane coupling agents is less than ten years old and is attracting attention from researchers in industry and academia alike. There is no comprehensive book on this topic on the market. Silanes for corrosion of metals provides the chemistry of silanes in solution and at metal surfaces as well as mechanisms of corrosion protection and paint adhesion by silanes. Modification of silane films for improved protection capabilities, e.g., by the addition of corrosion inhibitors, nanoparticles, or organic resins, is also covered.

**Features**
- The first book of its kind to solely feature the role of silanes in corrosion prevention
- Provides an up to date review of mechanisms and literature in the field

**Contents**
Definitions – Scope of Book.- Synthesis of Silanes.- Classification of Silane Types.- Behavior of Silanes in Solution.- Rate of Hydrolysis and Condensation.- Interaction of Silanes with Metals and Ceramics.- Which Corrosion Forms can be controlled by Silane Films? How?- Paint Adhesion by Silanes.- Mechanisms (of Corrosion Protection; Paint Adhesion; Rubber Bonding).- Additions to Silane Solutions (for Performance Improvement).- Silane Additions to Primers (Superprimer Technology).- Electrodeposition of Silanes and Superprimers.

**Fields of Interest**
Tribology, Corrosion and Coatings; Metallic Materials; Quality Control, Reliability, Safety and Risk; Continuum Mechanics and Mechanics of Materials

**Target groups**
Research

**Product category**
Monograph

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M. N. Tamin, Universiti Teknologi Malaysia, Skudai, Malaysia; N. M. Shaffiar, International Islamic University Malaysia, Kuala Lumpur, Malaysia

**Solder Joint Reliability Assessment**

**Finite Element Simulation Methodology**

This book presents a systematic approach in performing reliability assessment of solder joints using Finite Element (FE) simulation. Essential requirements for FE modelling of an electronic package or a single reflowed solder joint subjected to reliability test conditions are elaborated. These cover assumptions considered for a simplified physical model, FE model geometry development, constitutive models for solder joints and aspects of FE model validation. Fundamentals of the mechanics of solder material are adequately reviewed in relation to FE formulations.

**Features**
- Presents a systematic approach in performing reliability assessment
- Emphasizes accurate quantitative assessment through basic understanding of the mechanics of materials
- The presented simulation methodology is readily applicable to numerous problems

**Contents**

**Fields of Interest**
Characterization and Evaluation of Materials; Continuum Mechanics and Mechanics of Materials; Quality Control, Reliability, Safety and Risk

**Target groups**
Research

**Product category**
Monograph
Quantum Dot Molecules

Features
- Presents the first comprehensive reference focused solely on quantum dot molecules
- Provides state-of-the-art coverage of novel technologies and techniques
- Connects fundamental physical properties with device design
- Features contributions from worldwide leaders in the field

Contents

Fields of interest
Optical and Electronic Materials; Quantum Optics; Nanotechnology and Microengineering

Target groups
Research

Product category
Monograph

Transport Properties of Molecular Junctions

Features
- Gives an overview of the main physical mechanisms that control electron transport and the main characteristics of metal-molecule-metal (MMM) junctions
- Discusses nanoelectronic applications of molecular junctions and similar systems
- Appendices contains MATLAB code used in the creation of the text

Contents

Fields of interest
Nanotechnology; Electronics and Microelectronics, Instrumentation; Applied and Technical Physics

Target groups
Research

Product category
Monograph

Due September 2013
- € (D) 139,09 | € (A) 142,99 | sFr 173,50
- € 129,99 | £117.00
ISBN 978-1-4614-8129-4

Due August 2013
2013. XIV, 400 p. 104 illus., 95 in color. (Springer Tracts in Modern Physics, Volume 254) Hardcover
- *€ (D) 160,49 | € (A) 164,99 | sFr 200,00
- € 149,99 | £135.00