

Special Topics

Solid State Physics & Engineering

2014/Special Topic Volumes

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Diffusion in Advanced Materials

Eds. Graeme Murch et al. / Diffusion Foundations Vol. 1

In the first chapter Prof. Kozubski and colleagues present atomistic simulations of superstructure transformations of intermetallic nanolayers. In Chapter 2, Prof. Danielewski and colleagues discuss a formalism for the morphology of the diffusion zone in ternary alloys. In Chapter 3, Professors Sprengel and Koiwa discuss the classical contributions of Boltzmann and Matano for the analysis of concentration-dependent diffusion. This is followed by Chapter 4 by Professor Cserháti and colleagues on the use of Kirkendall porosity for fabricating hollow hemispheres. In Chapter 5, Professor Morton-Blake reports on molecular dynamics calculations of ions in a synthetic channel. In Chapter 6, Professor Bokstein and Dr Rodin review grain boundary diffusion and segregation in metals and alloys. This is followed by a review by Professor Mehrer on diffusion in glassy metals (Chapter 7). In Chapter 8 Professor Prochazka and colleagues report on defects and sintering in yttria-stabilized zirconia using positron annihilation spectroscopy and in Chapter 9 Professor Fishman... and colleagues report on mechanical activation of Mn-O oxides. Finally in Chapter 10 Professors Popova and Popov analyse the role of diffusion in the structure and texture of Cu-Nb composites.

978-3-03835-081-1 (paperback), 222 pages, 2014, US\$138.00/€100.00, also available on CD (978-3-03795-776-9) and eBook (978-3-03826-462-0) at same price.

Defects and Diffusion in Carbon Nanotubes

Ed. D.J. Fisher / Defect and Diffusion Forum Vol. 356

Carbon nanotubes are one of the newest materials to be discovered, being barely 20 years old. The present compilation focuses on the various characteristic types of defect which are found in carbon nanotubes, plus the relatively limited number of diffusion studies which have been performed. The 418 entries cover the period from 1994 to 2014.

978-3-03835-219-8 (paperback), 212 pages, 2014, US\$138.00/€100.00, also available on CD (978-3-03795-915-2) and eBook (978-3-03826-602-0) at same price.

French Activity on High Temperature Corrosion in Water Vapor

Sébastien Chevalier et al. / Materials Science Foundations Vol. 76

Increased clarity in our understanding of water vapor effects on oxidation is resulting from our recognition that multiple mechanisms are possible, and that distinctions must be drawn between situations where, on the one hand, molecular oxygen accompanies water vapor, and on the other, it does not, and instead free hydrogen can be present. It is a pleasure to welcome the contributions of this new book to this important field. Whilst the existence of a substantial French research effort in the area has been well known, the scale and extent of the effort comes as something of a surprise. The reason for this is apparent in the reference lists provided at the end of each chapter: much of the work is simply not available in the readily accessed literature. The book performs an important service in bringing these results to the attention of the wider research community. Overall, the book succeeds well in its aim of presenting an integrated view of water vapor effects on high temperature corrosion. Its organization into chapters concerned with different alloy classes is appealing, and the contents should prove useful to many readers.

978-3-03785-996-4 (paperback), 206 pages, 2014, US\$138.00/€100.00, also available on CD (978-3-03795-696-0) and eBook (978-3-03826-382-1) at same price.

Current Research on Functional Materials

Eds. Yuxun Wang et al. / Advanced Materials Research Vol. 1053

The development of functional materials is at the heart of technological needs and the forefront of materials research. This book provides a comprehensive and up-to-date collection of peer reviewed reports on functional materials. The 76 papers are grouped as follows: Chapter 1: Metallic, Magnetic, Electric and Photoelectric Functional Materials; Chapter 2: Nano and Inorganic Functional Materials; Chapter 3: Organic and Polymer Functional Materials; Chapter 4: Thin Film, Membrane and Coating Materials; Chapter 5: Biological and Environmental Functional Materials.

978-3-03835-263-1 (paperback), 526 pages, 2014, US\$276.00/€200.00, also available on CD (978-3-03795-959-6) and eBook (978-3-03826-647-1) at same price.

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Luminescence

Basic Concepts, Applications and Instrumentation

Ed. Hardev Singh Virk / Defect and Diffusion Forum Vol. 357

The word luminescence was first used by a German physicist, Eilhardt Wiedemann, in 1888. He also classified luminescence into six kinds according to the method of excitation. This Volume consists of 9 Chapters, including 8 Review Papers and one Case Study. The 9th Chapter is added as a case study. The authors, JN Reddy and KVR Murthy, claim that the primary objective of their PC Controlled TL Reader is to bring out versatile TL instrumentation system and also to make it affordable to many of the researchers in the Universities and other areas, including Radio-therapy and Medical Physics.

978-3-03835-195-5 (paperback), 260 pages, 2014, US\$138.00/€100.00, also available on CD (978-3-03795-891-9) and eBook (978-3-03826-578-8) at same price.

A Directory of Arrhenius Parameters - Metals -

Ed. D.J. Fisher / Defect and Diffusion Forum Vol. 352

The simple, empirical, surprisingly accurate and venerable Arrhenius equation, based upon the work of Van't Hoff, is very useful for summarising large bodies of experimentally determined diffusion data for a given host/diffusant system. It is the first port of call for any researcher planning new diffusion studies, or for engineers who need to estimate heat-treatment times in manufacturing processes. The present compilation covers Arrhenius parameters for the host-metals: aluminum, barium, beryllium, cadmium, chromium, cobalt, copper, gallium, gold, hafnium, indium, iridium, iron, lead, lithium, magnesium, molybdenum, nickel, niobium, palladium, platinum, potassium, rhodium, ruthenium, scandium, silver, sodium, tantalum, thallium, thorium, tin, titanium, tungsten, vanadium, zinc and zirconium. The 1315 entries cover the period from 1927 to 2013.

978-3-03835-116-0 (paperback), 358 pages, 2014, US\$138.00/€100.00, also available on CD (978-3-03795-811-7) and eBook (978-3-03826-497-2) at same price.

A Directory of Arrhenius Parameters - Non-Metals -

Ed. D.J. Fisher / Defect and Diffusion Forum Vol. 355

As in the case of Defect and Diffusion Forum, Volume 352, the present volume comprises a compilation of Arrhenius equations which conveniently summarise a huge body of experimental results on diffusion in a wide variety of non-metallic host/diffusant systems. This collection will constitute an excellent resource for any researcher planning new diffusion studies, or for engineers who need to estimate heat-treatment times for manufacturing steps, or to predict the effect of the environment on finished products. The 1133 entries cover the period from 1952 to 2014.

978-3-03835-169-6 (paperback), 358 pages, 2014, US\$138.00/€100.00, also available on CD (978-3-03795-865-0) and eBook (978-3-03826-552-8) at same price.

Advanced Design and Manufacture V

Eds. Daizhong Su and Shifan Zhu

Key Engineering Materials Vol. 572

The book is a prestigious collection of refereed papers in advanced design, manufacture and related subject areas. The 161 papers are grouped as follows: I. Sustainable Development and Technologies; II. Product/Industrial Design and Design Methodologies; III. Engineering Design; IV. Production, Manufacture and Engineering Materials; V. CAD/CAM/CAE; VI. Gearing, Mechanical Transmission and Mechanisms; VII. Machine Condition Monitoring; VIII. Finite/Boundary Element Methods; IX. Optimisation, Simulation and Computing Technologies; X. Manufacturing Informatics; XI. Robots and Control; XII. Engineering Management and Enterprise.

978-3-03785-819-6 (paperback), 736 pages, 2014, US\$276.00/€200.00, also available on CD (978-3-03795-534-5) and eBook (978-3-03826-200-8) at same price.

Advanced Diffusion Processes and Phenomena

Eds. Andreas Öchsner et al. / Defect and Diffusion Forum Vol. 354

This topical volume on Advanced Diffusion Processes and Phenomena addresses diffusion in a wider sense of not only mass diffusion but also heat diffusion in fluids and solids. Both diffusion phenomena play an important role in the characterization of engineering materials and corresponding structures. Understanding these different transport phenomena at many levels, from atomistic to macro, has therefore long attracted the attention of many researchers in materials science and engineering and related disciplines. The present topical volume captures a representative cross-section of some of the recent advances in the area of mass and heat transport. Reflecting the enormous breadth of the area, the range of topics covered is accordingly very large.

978-3-03835-131-3 (paperback), 234 pages, 2014, US\$138.00/€100.00, also available on CD (978-3-03795-827-8) and eBook (978-3-03826-514-6) at same price.

Applied Mechanics and Mechatronics

Ed. František Trebuňa / Applied Mechanics and Materials Vol. 611

The issue "Applied Mechanics and Mechatronics" contains results of research from researchers and designers from several prominent universities and research institutes of Central Europe. The publication is divided into three following chapters: Modeling and Simulation of Mechanic and Mechatronic Systems, Analysis and Design of Mechanic and Mechatronic Systems, Experimental methods in Mechanics and Mechatronics. The submitted publication provides insight on modern approaches and methods in designing, modeling and experimental analyzing of

mechanic and mechatronics systems.

978-3-03835-189-4 (paperback), 578 pages, 2014, US\$207.00/€150.00, also available on CD (978-3-03795-885-8) and eBook (978-3-03826-572-6) at same price.

Control Engineering in Materials Processing II

Ed. Andrzej Kot / Solid State Phenomena Vol. 208

The special topic volume with invited papers covers works implementing the Control Theory to materials processing, especially the field of putting materials properties to its better use in manufacturing processes. Instead of only using principles of control theory for materials, researchers use phenomena arising in materials for control purposes. In this topic book most considerations are focused on the group of "Smart Materials" i.e. Shape Memory Alloys (SMA) or Piezoelectrics.

978-3-03785-855-4 (paperback), 212 pages, 2014, US\$138.00/€100.00, also available on CD (978-3-03795-563-5) and eBook (978-3-03826-236-7) at same price.

Design, Testing and Characteristics of Mechatronic Devices

Eds. Stanislav Fabian et al. / Applied Mechanics and Materials Vol. 460

Design, Testing and Characteristics of Mechatronic Devices is a special topic volume of scientific papers. The topic belongs to the fundamental research fields that are solved at the Faculty of Manufacturing Technologies of Technical University of Košice with a seat in Prešov for long period of time. Dealing with such kind of research is necessarily associated with high theoretical demands, so authors would like to disseminate achieved knowledge in research, educational and entrepreneurial areas.

978-3-03785-931-5 (paperback), 120 pages, 2014, US\$124.00/€90.00, also available on CD (978-3-03795-625-0) and eBook (978-3-03826-312-8) at same price.

Diffusion and Conduction in Zeolites

Ed. D.J. Fisher / Defect and Diffusion Forum Vol. 351

The microporous aluminosilicate minerals known as Zeolites are invaluable as adsorbents, molecular sieves and catalysts because they possess a porous structure that can let pass or accommodate cations such as, Ca²⁺, K⁺, Mg²⁺, Na⁺, etc. These are nevertheless loosely held and can be easily exchanged for those in an adjacent solution. Movement of other materials through Zeolites is naturally an important factor. The present compilation consists of diffusion data. These represent, as far as possible, pure diffusion, shorn of other transfer mechanisms such as permeation. Most of the results involve well-known artificially produced Zeolites, but also include information on naturally occurring Zeolites such as analcime and clinoptilolite. The 290 entries, 22 figures and 67 tables cover the period from 1961 to 2014.

978-3-03835-080-4 (paperback), 210 pages, 2014, US\$138.00/€100.00, also available on CD (978-3-03795-775-2) and eBook (978-3-03826-461-3) at same price.

Diffusion in Halides - Data Compilation

Ed. D.J. Fisher / Defect and Diffusion Forum Vol. 350

The present issue comprises a compilation of data on diffusion in halides in either the crystalline or molten state; that is, diffusion in aqueous systems is not covered. The data cover a period of almost 50 years: from 1965 to the beginning of 2014. The over 700 entries, 205 tables and 34 figures will provide an invaluable wealth of information on diffusion in this class of material.

978-3-03835-061-3 (paperback), 334 pages, 2014, US\$138.00/€100.00, also available on CD (978-3-03795-756-1) and eBook (978-3-03826-442-2) at same price.

Environmental and Safety Aspects of Renewable Materials and Energy Sources

Eds. Juraj Ladomerský, Karol Balog, Jozef Martinka et al.

Advanced Materials Research Vol. 1001

This special topic volume tends to present leading publications dealing with the Environmental and Safety Aspects of Renewable Materials and Energy Sources. The aims and scope are divided into four main areas: Chapter 1. Environmental aspects of selected renewable sources, Chapter 2. Fire safety aspects of selected renewable sources, Chapter 3. Occupational safety and health aspects of selected renewable sources, Chapter 4. Other safety aspects of selected renewable sources.

978-3-03835-198-6 (paperback), 558 pages, 2014, US\$276.00/€200.00, also available on CD (978-3-03795-894-0) and eBook (978-3-03826-581-8) at same price.

Fluid Flow, Energy Transfer and Design

Eds. Antonio F. Miguel, Luiz Rocha and Andreas Öchsner

Defect and Diffusion Forum Vol. 348

The special session "Fluid Flow, Energy Transfer and Design" held at the 9th International Conference on Diffusion in Solids and Liquids (DSL 2013) sheltered papers of different areas ranging from physics, mathematics and chemistry to engineering. It served as a link under which authors of different areas and backgrounds came together, and make their research accessible to the varied audience. In this sense worked to counter the possible divisive tendency. This special issue is a fitting tribute to the different views since this is not a divisive tendency but the seethe of science that shapes the ever-changing landscapes of our research world.

978-3-03835-000-2 (paperback), 304 pages, 2014, US\$138.00/€100.00, also available on CD (978-3-03795-691-5) and eBook (978-3-03826-377-7) at same price.

Frontiers of Nanofiber Fabrication and Applications

Eds. Hong-Yan Liu and Ji-Huan He / *Advanced Materials Research* Vol. 843

This special issue covers mainly electrospinning, vibration-electrospinning, bubble electrospinning and blown bubble spinning, and it is a good reference not only for materials science, but also for various communities in physics, nanotechnology and chemistry.

978-3-03785-948-3 (paperback), 130 pages, 2014, US\$124.00/€90.00, also available on CD (978-3-03795-643-4) and eBook (978-3-03826-329-6) at same price.

Glass Science and its Applications - II

Eds. Nandyala Sooraj Hussain et al. / *Solid State Phenomena* Vol. 207

The present special topic volume entitled "Glass Science and its Applications – II" covers different glasses and glass ceramic materials for technological and biomedical applications. The authors hope that this special volume may be useful for those who are searching for a general overview of glass science and its applications in different fields.

978-3-03785-847-9 (paperback), 116 pages, 2014, US\$110.00/€80.00, also available on CD (978-3-03795-556-7) and eBook (978-3-03826-228-2) at same price.

Hydrogen Diffusion in Metals - Data Compilation

Ed. D.J. Fisher / *Defect and Diffusion Forum* Vol. 349

Due to its small size, the hydrogen atom is, wanted or unwanted, an ubiquitous diffusant in many metallic systems. It has long been known for its harmful effect upon mild steel sheet; the deleterious phenomenon of hydrogen-embrittlement having been recognized since the early days of the industrial revolution. Its behavior in some metals is further complicated by its tendency to form hydrides with the metal, or with various non-metallic impurities. The ability of some metals and alloys to store large quantities of hydrogen – first recognized in the 19th century – is another complicating factor. The complexity of metal-hydrogen behavior was undoubtedly also the cause of the mistaken 'cold fusion' claims of the late 1980s. The present issue comprises a compilation of hydrogen diffusion and permeation data in metals. These data are believed to be 'pure': that is, free from the interfering effects of hydride formation, etc. The almost 600 entries, 201 tables and 41 figures cover the period from 1966 to 2013. These are supplemented by an original review, by T.B. Flanagan of the University of Vermont, which has as its subject, The Role of the Thermodynamic Factor in Hydrogen Diffusion in Metal and Alloy Membranes.

978-3-03835-024-8 (paperback), 362 pages, 2014, US\$138.00/€100.00, also available on CD (978-3-03795-719-6) and eBook (978-3-03826-405-7) at same price.

Light Metal and their Alloys III

Technology, Microstructure and Properties

Eds. Anna J. Dolata and Maciej Dyzia / *Solid State Phenomena* Vol. 211

The issue collects papers presenting most current results of research in the scope of light metal alloys. That volume include three chapters: I – aluminium alloys, II – magnesium alloys and III – titanium alloys. Chapter I presents subjects related to manufacturing of aluminum alloys, grain refinement and welding joints. The chapter presents also result of investigations concerning methods of obtaining and properties of aluminium matrix composites. Chapter II contain papers presenting the results of researches carried out on conventional and new casting magnesium alloys. The first group of articles concern the effects of modification on structure and properties of casting alloys. Following papers present results on plastic deformation of Mg alloys. Subsequent articles cover topics related to welding technologies. The last chapter concern the magnesium matrix composites. Results of researches carried out on titanium alloys are presented in Chapter III. Papers included in this section concern the microstructure and properties Ti alloys. Possibilities of heat treatment and diffusion brazing are also discussed.

978-3-03785-956-8 (paperback), 166 pages, 2014, US\$138.00/€100.00, also available on CD (978-3-03795-651-9) and eBook (978-3-03826-337-1) at same price.

Luminescence Related Phenomena and their Applications

Ed. Hardev Singh Virk

Defect and Diffusion Forum Vol. 347

This special volume consists of eight chapters consisting of seven Review papers and one Research paper. "Luminescence Phenomena: An Introduction" is the first Chapter contributed by KVR Murthy and HS Virk. It explains the basic phenomenon of Luminescence: "Luminescence is 'cold light', light from other sources of energy which can take place at normal and lower temperatures. Luminescence is basically a phenomenon of emission of light from an insulator followed by prior absorption of energy from ionizing radiations like, X-rays, alpha, beta and gamma radiations. The energy lifts the atoms of the material into an excited state, and then, because excited states are unstable, the material undergoes another transition, back to its unexcited ground state, and the absorbed energy is liberated in the form of either light or heat or both.

978-3-03785-958-2 (paperback), 276 pages, 2014, US\$138.00/€100.00, also available on CD (978-3-03795-653-3) and eBook (978-3-03826-339-5) at same price.

Manufacturing Automation Technology and System I

Eds. Wang Guanglin et al. / *Key Engineering Materials* Vol. 620

This special issue communicates the latest progress and research of new theory, technology, method, equipment in materials processing and manufacturing automation technology field, and to grasp the forefront technological and research

trends worldwide, which will drive international communication and cooperation of production, education and research in this field.

978-3-03835-185-6 (paperback), 724 pages, 2014, US\$276.00/€200.00, also available on CD (978-3-03795-881-0) and eBook (978-3-03826-568-9) at same price.

Manufacturing Automation Technology and System II

Eds. Wang Guanglin et al. / *Key Engineering Materials* Vol. 621

This special issue communicates the latest progress and research of new theory, technology, method, equipment in materials processing and manufacturing automation technology field, and to grasp the forefront technological and research trends worldwide, which will drive international communication and cooperation of production, education and research in this field.

978-3-03835-186-3 (paperback), 762 pages, 2014, US\$276.00/€200.00, also available on CD (978-3-03795-882-7) and eBook (978-3-03826-569-6) at same price.

Materials for Biomedical Applications

Eds. Mohammad A. Jafar Mazumder and Amir Al-Ahmed

Advanced Materials Research Vol. 995

This book summarises the up-to-date status of the field, covers important scientific and technological developments by many distinguished experts, who came together to contribute their research work and comprehensive, in-depth and up to date articles. Written in a versatile and contemporary style, this book can be used as an invaluable reference source for graduate students, scientist, researcher working in chemistry, polymer chemistry, polymer engineering, chemical engineering and materials science. We are thankfully appreciate the tremendous efforts and co-operation of all contributing authors for their devotion, valuable time in preparing state-of-art chapters for this book. We would also like to express our gratitude to the publishers and all authors, and others for granting us the copyright permissions to use their illustrations. Although sincere efforts were made to obtain the copyright permissions from the respective owners to include the citation with the reproduced materials, we would like to offer our sincere apologies to any copyright holder if unknowingly their right is being infringed.

978-3-03835-182-5 (paperback), 152 pages, 2014, US\$138.00/€100.00, also available on CD (978-3-03795-878-0) and eBook (978-3-03826-565-8) at same price.

Multi-Functional Nanomaterials and their Emerging Applications

Eds. Alagarsamy Pandikumar et al. / *Materials Science Forum* Vol. 781

The multi-functional properties of nanomaterials offer a wide range of opportunities for addressing several research and development challenges in the area of nanoscience and nanotechnology. Multi-functional nanomaterials find wide application in a variety of sectors including agriculture, medicine, telecommunications, disaster management and environmental conservation. The focus of this special topic volume is on multifunctional nanomaterial development and their emerging applications towards commercialization. It illustrates a new pathway to achieve novel practical applications using nanomaterials and can be utilized as a text for researchers as well as graduate students who are interested in nanomaterials based applications.

978-3-03835-067-5 (paperback), 178 pages, 2014, US\$138.00/€100.00, also available on CD (978-3-03795-762-2) and eBook (978-3-03826-448-4) at same price.

Novel Trends in Production Devices and Systems

Eds. Karol Velišek et al. / *Applied Mechanics and Materials* Vol. 474

The book is aimed at publishing scientific achievements on the Novel Trends in Production and Systems as well as at enhancing the worldwide cooperation and recognition among young and senior academicians and/or practitioners, and specially those of the central European region. Some of the main topics included in the book are those related but not limited to Mechanical and Machine Designs, Machining Tools, Trends in Production Devices and Systems, Production Logistics, Flexible/Intelligent Manufacturing Systems and Cells, Robotics and Automation, Rapid Prototyping, Trends in Applied Mechanics and Materials, Maintenance, New Teaching and Research Approaches, among others.

978-3-03785-944-5 (paperback), 490 pages, 2014, US\$166.00/€120.00, also available on CD (978-3-03795-639-7) and eBook (978-3-03826-325-8) at same price.

Operation and Diagnostics of Machines and Production Systems Operational States II

Eds. Stanislav Fabian et al. / *Applied Mechanics and Materials* Vol. 616

Special Topic Volume entitled Operation and Diagnostics of Machines and Production Systems Operational States II is focused on the operation, technology and diagnostics of operational states of machines and manufacturing systems. The topic covers research fields that are mainly solved at the Faculty of Manufacturing Technologies of Technical University of Košice with a seat in Prešov for long period of time. Dealing with such kind of research is necessarily associated with high theoretical demands, so authors would like to disseminate achieved knowledge in research, educational and entrepreneurial areas.

978-3-03835-201-3 (paperback), 376 pages, 2014, US\$207.00/€150.00, also available on CD (978-3-03795-897-1) and eBook (978-3-03826-584-9) at same price.

Potential Development in Dye-Sensitized Solar Cells for Renewable Energy

Eds. Alagarsamy Pandikumar et al. / Materials Science Forum Vol. 771

The development of photovoltaic technology is expected to solve problems related to energy shortages and environmental pollution caused by the use of fossil fuels. Dye-sensitized solar cells (DSSCs) are promising next-generation alternatives to conventional silicon-based photovoltaic devices owing to their low manufacturing cost and potentially high conversion efficiency. This special topic volume addresses recent advances in the research on dye-sensitized solar cells. The focus of this special topic volume is on materials development (sensitizers, nanostructured oxide films, and electrolyte), but commercialization. This work illustrates a new pathway to achieve highly efficient DSSCs for practical applications.

978-3-03785-909-4 (paperback), 200 pages, 2014, US\$138.00/€100.00, also available on CD (978-3-03795-603-8) and eBook (978-3-03826-290-9) at same price.

Progress in Functional Manufacturing Technologies III

Eds. Taiyong Wang et al. / Key Engineering Materials Vol. 584

The special volume communicates the latest progress and research results of new theory, new technology, method, equipment and so on in advanced manufacturing technology field, and to grasp the updated technological and research trends internationally. The major topics covered by the special volumes include Applied Materials Engineering, Materials Processing Technologies and Mechanical Engineering, Monitoring Method and Technology in Mechanical Engineering, Control System in Mechanical Engineering, Management and Development of Manufacturing Technologies.

978-3-03785-872-1 (paperback), 348 pages, 2014, US\$138.00/€100.00, also available on CD (978-3-03795-554-3) and eBook (978-3-03826-253-4) at same price.

Progress in Manufacturing Automation Technology and Application

Eds. Guanglin Wang et al. / Key Engineering Materials Vols. 579-580

The special topic volume is not only to communicate the latest research and progress of the new technology, theory, method, equipment in the field of materials processing and manufacturing automation technology, but also to master cutting-edge technology and research trends on a global scale, which can promote international cooperation and communication of production and research in this field.

978-3-03785-827-1 (paperback), 956 pages, 2014, US\$276.00/€200.00, also available on CD (978-3-03795-543-7) and eBook (978-3-03826-208-4) at same price.

Progress in Mechanical Engineering and Technology

Eds. Jacek Kropiwnicki et al. / Key Engineering Materials Vol. 597

The book is a collection of invited papers concerning Progress in Mechanical Engineering and Technology. All accepted papers were subjected to a strict peer-review. The papers disseminate the latest research. The book represents cooperative effort to seek out the best strategies for effective improvements in the quality and the reliability of machines and machine parts and to widen their application.

978-3-03785-960-5 (paperback), 220 pages, 2014, US\$124.00/€90.00, also available on CD (978-3-03795-655-7) and eBook (978-3-03826-341-8) at same price.

Recent Progress in Diffusion Thermodynamics and Kinetics in Intermetallic Compounds

Ed. R. Kozubski

Diffusion Foundations Vol. 2

The present volume presents a series of 7 extended articles devoted to diverse aspects of diffusion in intermetallic phases studied both experimentally and theoretically. The opening chapter gives an overview on the subject matter and focuses on binary intermetallics. It is followed by two works presenting results obtained by means of two particular promising experimental methods that allow the observation of diffusion phenomena in terms of individual acts of atomic migration. Diffusion in nanostructured intermetallic materials is addressed in the following two contributions which discuss a hot topic of diffusion-controlled solid-state reactions including self-propagating high-temperature synthesis (SHS). Etc.

978-3-03835-265-5 (paperback), 229 pages, 2014, US\$138.00/€100.00, also available on CD (978-3-03795-961-9) and eBook (978-3-03826-649-5) at same price.

Short-Term and Long-Term Behaviour of Reinforced Self-Compacting Concrete Structures

Ed. Farhad Aslani / Materials Science Foundations Vol. 77

Self-Compacting Concrete (SCC) refers to a 'highly flow-able, non-segregating

concrete that can be spread into place, fill the formwork, and encapsulate the reinforcement without the aid of any mechanical consolidation. SCC is regarded as one of the most promising developments in concrete technology due to significant advantages over Conventional Concrete (CC). In this study cracking caused by external loads in reinforced SCC and FRSCC slabs is examined experimentally and analytically. The mechanisms associated with the flexural cracking due to the combined effects of constant sustained service loads and shrinkage are observed. One of the primary objectives of this study is to develop analytical models that accurately predict the hardened mechanical properties of SCC and FRSCC. Subsequently, these models have been successfully applied to simulate time-dependent cracking of SCC and FRSCC one-way slabs.

978-3-03835-999-9 (paperback), 556 pages, 2014, US\$207.00/€150.00, also available on CD (978-3-03795-998-5) and eBook (978-3-03826-498-9) at same price.

SIMS Diffusion Studies - A Compilation

Ed. D.J. Fisher / Defect and Diffusion Forum Vols. 345-346

During the past 40 years, secondary ion mass spectrometry (SIMS) has become increasingly more popular for measuring diffusivities because it avoids the handling problems, environmental concerns and shortage of suitable isotopes which are associated with the use of radioactive tracer methods. The present compilation of nearly 800 items covers a selection of mainly quantitative results, obtained using secondary ion mass spectrometry, for diffusivities in a wide range of materials.

978-3-03785-954-4 (paperback), 450 pages, 2014, US\$138.00/€100.00, also available on CD (978-3-03795-649-6) and eBook (978-3-03826-335-7) at same price.

Some Research Results on Bridge Health Monitoring, Maintenance and Safety III

Ed. Yang Liu / Key Engineering Materials Vol. 574

The amount of deteriorating bridges is increasing gradually, and the costs of maintenance, repair and rehabilitation of these bridges often far exceed available budgets. To alleviate this issue, the bridge engineering profession continues to take positive steps towards developing more comprehensive bridge monitoring and management systems. This collection of invited papers encompasses some aspects of bridge health monitoring, maintenance and safety. Specifically, it deals with: bridge health monitoring; bridge repair and rehabilitation issues; bridge related safety and other implications.

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Some Research Results on Bridge Health Monitoring, Maintenance and Safety IV

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