

Ion Plasma Protective Coatings For Gas Turbine Engine Blades

This conference consisted of 15 oral sessions, including three plenary papers covering areas of general interest, 22 invited papers and 51 contributed presentations as well as three poster sessions. There were several scientific highlights from a diverse spectrum of materials and ion beam processing methods. These included a wide range of conventional and novel applications such as: optical displays and opto-electronics, motor vehicle and tooling parts, coatings tailored for desired properties, studies of fundamental defect properties, the production of novel (often buried) compounds, and treating materials. The study of nanocrystals produced by ion implantation in a range of host matrices, particularly for opto-electronic applications, was one especially new and exciting development. Despite several decades of study, major progress was made at the conference in understanding defect evolution in semiconductors and the role of defects in transient impurity diffusion. The use of implantation to tune or isolate optical devices and in forming optically active centres and waveguides in semiconductors, polymers and oxide ceramics was a major focus of several presentations at the conference. The formation of hard coatings by ion-assisted deposition or direct implantation was also an area which showed much recent progress. Ion beam techniques have developed apace, particularly those based on plasma immersion ion implantation or alternative techniques for large area treatment. Finally, the use of ion beams for the direct treatment of cancerous tissue was a particularly novel and important application of ion beams.

This book highlights recent findings in industrial, manufacturing and mechanical engineering, and provides an overview of the state of the art in these fields, mainly in Russia and Eastern Europe. A broad range of topics and issues in modern engineering are discussed, including the dynamics of machines and working processes, friction, wear and lubrication in machines, transport and technological machines, manufacturing engineering of industrial facilities, materials engineering, metal processing, control systems and their industrial applications, industrial mechatronics, automation and robotics. The book gathers papers presented at the 6th International Conference on Industrial Engineering (ICIE), held in Sochi, Russia in May 2018. The authors are experts in various fields of engineering, and all papers have been carefully reviewed. Given its scope, the book is of interest to a wide readership, including mechanical and production engineers, lecturers in engineering disciplines, and engineering graduates.

This book presents the proceedings of the 17th International Conference on Global Research and Education, Inter-ACADEMIA 2018 held in Kaunas, Lithuania on 24–27 September 2018. The main goal of the conference was to provide an international forum to review, stimulate, and understand the recent trends in both fundamental and applied research. In addition to the interest in recent research findings, the conference aimed to strengthen the cooperation between the partners of the Inter-ACADEMIA community towards new theoretical and practical research advances. The papers included cover topics in material science and technology, nanotechnology, plasma physics, biotechnology and environmental engineering, electronic engineering, robotics, measurement, identification, and control, soft computing techniques and modeling, and e-Learning. The book is a valuable scientific reference resource for the global scientific community.

Investigation of Plasma/ion Vapor Deposition (IVD) Hybrid Coatings for Corrosion Protection and Plasma Destruction of Bacteria

Introduction to Surface Engineering

Fundamentals and Applications

Proceedings of the International Conference on Ion and Plasma Assisted Techniques

Patents

Protection of Materials and Structures from the Low Earth Orbit Space Environment

A comprehensive review of ion beam application in modern materials research is provided, including the basics of ion beam physics and technology. The physics of ion-solid interactions for ion implantation, ion beam synthesis, sputtering and nano-patterning are treated in detail. Its applications in materials research, development and analysis, developments of special techniques and interfacial mechanisms of ion beams with solid state matter result in the optimization of new material properties, which are discussed. Solid-state properties optimization for functional materials such as doped semiconductors and metal layers for nano-electronics, alloys, and nano-patterned surfaces is demonstrated. The ion beam is an important tool for both materials processing and analysis. Researchers engaged in solid-state physics and materials research, engineers and technologists in the field of modern functional materials will welcome this text.

This book addresses the problem of surface protection for aircraft engine turbine blades. It is based on the author's 30+ years of experience on the development and application of coatings to protect against oxidation and hot corrosion. It describes and details a methodology for optimizing turbine blade surface protection. The distinctions of this book from other publications on this topic include: The performance of protective coatings is assessed and evaluated by the complex interconnections of their chemical and phase composition, structure, and physical-mechanical properties; The properties of overlay coatings are given for the wide range of compositions, including the possible coatings states after their production and long-term service; The principles for calculating the stresses and strains for coated turbine blades are reviewed.

Provides a methodology for integrating materials selection with the design process, including simultaneous technical and economic evaluation. Save hours of frustrating research time: Get fast answers about the best material for a particular application. In the past, researching the endless sources on corrosion and materials in their countless applications were next to impossible. That's why this book was written: to help simplify your materials selection problems. It's an exhaustive source on the different corrosion-resistant materials, types of corrosion, factors affecting corrosion, passivation, corrosion monitoring, corrosion control measures, methodology of materials selection, and more.

A Bibliography with Indexes

Energy and Sustainability V

Fundamentals and Engineering

Characterization of Thin Amorphous Hydrogenated Carbon Films Produced by Plasma Source Ion Implantation as Protective

Coatings on Computer Hard Disks
 Handbook of Surface and Interface Analysis
 Optical Interference Coatings

Energy and Sustainability V is the proceedings of the 5th International Conference on Energy and Sustainability, held by the Wessex Institute of Technology. The modern world is highly dependent on the exploitation of fossil fuels. More recently, resources depletion and severe environmental effects deriving from the continuous use of these fuels has resulted in an increasing amount of interest in renewable energy resources and the search for sustainable energy policies. The changes required to progress from an economy mainly based on hydrocarbons to one taking advantage of sustainable energy resources are massive and require considerable scientific research as well as engineering systems. The effect also involves collaboration between different disciplines in order to arrive at optimum solutions, including buildings, energy networks, convenience systems, new energy storage solutions, waste to energy technologies, and many others. This book covers topics related to sustainability in energy and power production, storage, distribution and management. These include: Smart grids; Smart metering; Green ICT; Green buildings; Energy storage; Renewable energy resources; Plug-in Hybrid Vehicles (PHEV); Biofuels (solid, liquid, gas); Waste to energy; CO₂ capturing and management; Energy and transportation; Environmental risk; Energy policies; Greener power plant technologies; Hydrogen recovery techniques; Sustainable energy production.

Edited by prominent researchers and with contributions from experts in their individual areas, **Intelligent Energy Field Manufacturing: Interdisciplinary Process Innovations** explores a new philosophy of engineering. An in-depth introduction to Intelligent Energy Field Manufacturing (EFM), this book explores a fresh engineering methodology that not only integrates but goes beyond methodologies such as Design for Six Sigma, Lean Manufacturing, Concurrent Engineering, TRIZ, green and sustainable manufacturing, and more. This book gives a systematic introduction to classic non-mechanical manufacturing processes as well as offering big pictures of some technical frontiers in modern engineering. The book suggests that any manufacturing process is actually a process of injecting human intelligence into the interaction between material and the various energy fields in order to transfer the material into desired configurations. It discusses technological innovation, dynamic M-PIE flows, the generalities of energy fields, logic functional materials and intelligence, the open scheme of intelligent EFM implementation, and the principles of intelligent EFM. The book takes a highly interdisciplinary approach that includes research frontiers such as micro/nano fabrication, high strain rate processes, laser shock forming, materials science and engineering, bioengineering, etc., in addition to a detailed treatment of the so called "non-traditional" manufacturing processes, which covers waterjet machining, laser material processing, ultrasonic material processing, EDM/ECM, etc. Filled with illustrative pictures, figures, and tables that make technical materials more absorbable, the book cuts across multiple engineering disciplines. The majority of books in this area report the facts of proven knowledge, while the behind-the-scenes thinking is usually neglected. This book examines the big picture of manufacturing in depth before diving into the details of an individual process, demonstrating how innovations are achieved. It lowers barriers to technical innovation, meets new engineering challenges, and systematically introduces manufacturing processes.

This publication presents the proceedings of ICPMSE-3, the third international conference on Protection of Materials and Structures from the Low Earth Orbit Space Environment, held in Toronto April 25-26, 1996. The conference was hosted and organized by Integrity Testing Laboratory Inc, (ITL), and held at the University of Toronto's Institute for Aerospace Studies (UTIAS), where ITL is located. Twenty industrial companies, seven universities and eight government agencies from Canada, USA, United Kingdom, France, Israel, Russia, Ukraine and the Netherlands were represented by over 55 participants indicating increasing international co-operation in this critical arena of protection of materials in space. Twenty-five speakers, world experts in their fields, delivered talks on a wide variety of topics on various aspects of material protection in space, Representatives from the Canadian, American, European and Israeli space agencies as well as from leading space research laboratories of major aerospace industries gathered at UTIAS to discuss the latest developments in the field of material and structure protection from the harsh space environment, These proceedings are organized into four sections: a) AONOV and Radiation Effects on Materials and Structures in the Leo Space Environment; b) Interaction of Matter with the LEO Environment; c) Large Scale Coating Process Developments for Protection in LEO; d) Synthesis and Modification of Materials and Surfaces for Protection in LEO, This is the third in our on-going series of bi-annual international space materials conferences which began in 1992 in Toronto. Jacob Kleiman, Integrity Testing Laboratory Inc.

CRC Concise Encyclopedia of Nanotechnology
Ion Beam Modification of Materials
Intelligent Energy Field Manufacturing
Proceedings of the 4th International Conference on Industrial Engineering
Analysis and Control of Failure Process
Advanced Methods and Technologies in Metallurgy in Russia

Designed to give a concise but complete overview of the field, this book features contributions written by leading experts in the various areas. Topics include design, materials, film growth, deposition including large area, characterization and monitoring, and mechanical stress.

The CRC Concise Encyclopedia of Nanotechnology sets the standard against which all other references of this nature are measured. As such, it is a major resource for both skilled professionals and novices to nanotechnology. The book examines the design, application, and utilization of devices, techniques, and technologies critical to research at the time. This handbook is an excellent reference for materials scientists and engineers needing to gain more knowledge about these engineering materials. Following introductory chapters on the fundamental materials properties of titanium, readers will find comprehensive descriptions of the development, processing and properties of modern titanium alloys. There then follows detailed discussion of the applications of titanium and its alloys in aerospace, medicine, energy and automotive technology.

Advanced Manufacturing Processes

Proceedings of ICPMSE-3, Third International Space Conference, held in Toronto, Canada, April 25 – 26, 1996

Micro-Plasma Protective Coatings for 2024 and 7085 Aluminium Alloys

Encyclopedic Dictionary of Condensed Matter Physics

Proceedings of the 17th International Conference on Global Research and Education Inter-Academia – 2018

This book deals with the typical equipment, materials, processes, monitoring, and control used in the practical fabrication/production of optical thin films. It focuses on the practical elements needed to actually produce optical coatings.

This book highlights recent findings in industrial, manufacturing and mechanical engineering, and provides an overview of the state of the art in these fields, mainly in Russia and Eastern Europe. A broad range of topics and issues in modern engineering is discussed, including the dynamics of machines and working processes, friction, wear and lubrication in machines, surface transport and technological machines, manufacturing engineering of industrial facilities, materials engineering, metallurgy, control systems and their industrial applications, industrial mechatronics, automation and robotics. The book gathers selected papers presented at the 7th International Conference on Industrial Engineering (ICIE), held in Sochi, Russia, in May 2021. The authors are experts in various fields of engineering, and all papers have been carefully reviewed. Given its scope, the book will be of interest to a wide readership, including mechanical and production engineers, lecturers in engineering disciplines, and engineering graduates.

This volume entitled "Protective Coatings and Thin Films : Synthesis, Characterization and Applications" contains the Proceedings of the NATO Advanced Research Workshop (ARW) held in Alvor, Portugal from May 30 to June 5, 1996. This NATO-ARW was an expert meeting on the surface protection and modification of solid materials subjected to interactions with the environment. The meeting attracted 10 key speakers, 40 contributing speakers and 3 observers from various countries. The existing knowledge and current status of the science and technology related to protective coatings and thin films were assessed through a series of oral presentations, key notes (titles underlined in the volume contents) and contributed papers distributed over various sessions dealing with: (a) plasma-assisted physical and chemical vapor deposition processes to enhance wear and corrosion protection of materials, (b) low friction coatings operating in hostile environment (vacuum, space, extreme temperatures, . . .), (c) polymer films for protection against mechanical damage and chemical attack, (d) characterization of the structure of films and correlations with mechanical properties, (e) wear and corrosion resistant thermal spray coatings, (f) functional gradient ceramic/metallic coatings produced by high energy laser beam and energetic deposition processes for high temperature applications, (g) protective coatings for optical systems, and (h) ion beam assisted deposition of coatings for protection of materials against aqueous corrosion.

Supplement

bibelots, objets d'art... mobilier ancien et de style, tapis d'Orient : [vente, Versailles, Hôtel des Chevaux-légers, 18 septembre 1983 ; commissaires-priseurs, Mes P. Perrin, O. Perrin, Ph. Royère et A. Lajeunesse].

Ion Beam Processing of Materials and Deposition Processes of Protective Coatings

Thin Film Coatings for Biomaterials and Biomedical Applications

Fusion Energy Update

Technology for Large Space Systems

This report results from a contract tasking Nikolaev's Institute of Inorganic Chemistry as follows: Two strategies have historically been used to reduce corrosion in AA s: (1) barrier coatings and (2) electrochemically-active corrosion-inhibitors. Barriers are formed from materials impervious to the penetrations or migrations of such corrosion-inducing species as chloride ions, oxygen, water, and/or free electrons. Plasma oxidation would provide an impervious coating on the surface of specific aircraft parts thus enhancing their ability to prevent corrosion from beginning.

Superalloys form a class of the structural materials for high-temperature applications. Nickel superalloys are extensively used in the high-temperature components of gas turbines due to their excellent creep, fatigue, and corrosion resistance at elevated temperatures. These materials are considered paramagnetic in the range of working temperatures. This book presents the features of the

ternary phase diagrams Ni-Al-X (X = {Co, Fe, Nb, Ti, Cr}), effects of the alloying on the long-range order and mechanical properties of the Ni₃Al-based alloys. Description of the strain-induced ferromagnetism in the Ni₃Al-based alloys and magnetic control of the failure of gas turbine blades are also included. A separate section is devoted to the analysis of the vibration process and strength change in the single-crystal gas turbine blades. This book includes the review of the new intermetallic cobalt superalloys. The structure, crystal lattice parameters, orientation relationships between phases, mechanical and magnetic properties of the Co₃(Al,W)-based alloys are described. Non-destructive magnetic point control of the martensite content in low-magnetic austenitic alloys is a new method for detection of the local sites with internal stresses. This method is useful for the detection of the residual stress in the critical parts of industrial products. This book may be useful for specialists in material science, first-year postgraduate students taking a class in material science and engineering, and engineers developing new alloys for the gas turbine technology. The book provides a comprehensive overview of the most recent and advanced work on metallurgy sciences and technologies--including material characterization of complicated alloys, heat and surface treatment, ferrous metals metallurgy, and energy savings in pyrometallurgy--in the important Ural industrial region of Russia. Until recently, research into scientific and engineering problems within Russia developed along different lines than those in Europe and North America, but nevertheless resulted in remarkable achievements utilizing different tools and methodologies than those used in the West. Many of these achievements – particularly in metallurgy – were made in the Urals.

Synthesis, Characterization and Applications

Protective Coatings of Metal Surfaces by Cold Plasma Treatment

Journal of Protective Coatings & Linings

Materials Selection for Corrosion Control

High Temperature Corrosion

Large Space Structures & Systems in the Space Station Era

Integrating advances in instrumentation and methods, this work offers an approach to solving problems in surface and interface analysis, beginning with a particular problem and then explaining the most rational and efficient route to a solution. The book discusses electron optical and scanned probe microscopy, high spatial resolution imaging and synchrotron-based techniques. It emphasizes problem-solving for different classes of materials and material function.

This volume is a translation and revision of the Original Russian version by Baryahktar. It covers all of the main fields involved in Condensed Matter Physics, such as crystallography, electrical properties, fluids, magnetism, material properties, optics, radiation, semiconductors, and superconductivity, as well as highlights of important related subjects such as quantum mechanics, spectroscopy, and statistical mechanics. Both theoretical and experimental aspects of condensed matter are covered in detail. The entries range from very short paragraphs on topics where definitions are needed, such as Bloch's law, clathrate compound, donor, domain, Kondo lattice, mean free path, and Wigner crystal, to long discussions of more general or more comprehensive topics such as antiferromagnetism, crystal lattice dynamics, dislocations, Fermi surface, Josephson effect, luminescence, magnetic films, phase transitions and semiconductors. The main theoretical approaches to Condensed Matter Physics are explained. There are several long tables on, for example, Bravais lattices, characteristics of magnetic materials, units of physical quantities, symmetry groups. The properties of the main elements of the periodic table are given. Numerous entries not covered by standard Solid State Physics texts o Self-similarity o The adiabatic approximation o Bistability Emphasis on materials not discussed in standard texts o Activated carbon o Austenite o Bainite o Calamitics o Carbine o Delat phase o Discotics o Gunier-Preston zones o Heterodesmic structures o Heusler Alloys o Stress and strain deviators o Vicalloy

- Each entry is fully cross-referenced to help tracking down all aspects of a topic under investigation
- Highly illustrated to clarify many concepts

This book reports on innovative research and developments in the broad field of transportation. It covers solutions relating to intelligent vehicles and infrastructure, energy and combustion management, vehicle dynamics and control, as well as research on human factors, logistics and security.

Contributions are based on peer-reviewed papers presented at the 12th international scientific conference "Transbaltica: Transportation Science and Technology", held virtually from Vilnius Gediminas Technical University, Lithuania, on September 16-17, 2021. All in all, this book offers extensive information on modern transport systems, with a good balance of theory and practice. .

Selected Papers from the Grabchenko's International Conference on Advanced Manufacturing Processes (InterPartner-2019), September 10-13, 2019, Odessa, Ukraine

Practical Production of Optical Thin Films

Protective Coatings and Thin Films

Protective Coatings for Turbine Blades

Superalloys

Transportation Science and Technology : Proceedings of the 12th International Conference TRANSBALTICA, September 16-17, 2021, Vilnius, Lithuania

This book offers a timely yet comprehensive snapshot of innovative research and developments in the area of manufacturing. It covers a wide range of manufacturing processes, such as cutting, coatings, and grinding, highlighting the advantages provided by the use of new materials and composites, as well as new methods and technologies. It discusses topics in energy generation and pollution prevention. It shows how computational methods and mathematical models have been applied to solve a number of issues in both theoretical and applied research. Based on selected papers presented at the Grabchenko's International Conference on Advanced Manufacturing Processes (InterPartner-2019), held in Odessa, Ukraine on September 10-13, 2019, this book offers a timely overview and extensive information on trends and technologies in the area of manufacturing, mechanical and materials engineering. It is also intended to facilitate communication and collaboration between different groups working on similar topics, and to offer a bridge between academic and industrial researchers.

This book highlights recent findings in industrial, manufacturing and mechanical engineering, and provides an overview of the state of the art in these fields, mainly in Russia and Eastern Europe. A broad range of topics and issues in modern engineering are discussed, including the dynamics of machines and

working processes, friction, wear and lubrication in machines, surface transport and technological machines, manufacturing engineering of industrial facilities, materials engineering, metallurgy, control systems and their industrial applications, industrial mechatronics, automation and robotics. The book gathers selected papers presented at the 4th International Conference on Industrial Engineering (ICIE), held in Moscow, Russia in May 2018. The authors are experts in various fields of engineering, and all papers have been carefully reviewed. Given its scope, the book will be of interest to a wide readership, including mechanical and production engineers, lecturers in engineering disciplines, and engineering graduates.

Containing papers from the 2nd High Performance Design of Structures and Materials and the Optimum Design of Structures conference, following the success of a number of meetings since 1989, this book will be of interest to those in any engineering field. The use of novel materials and new structural concepts nowadays is not restricted to highly technical areas like aerospace, aeronautical applications or the automotive industry, but affects all engineering fields including those such as civil engineering and architecture. Most high performance structures require the development of a generation of new higher performance sustainable materials, which can more easily resist a range of external stimuli or react in a non-conventional manner. Emphasis is placed on intelligent structures and materials as well as the application of computational methods for their modelling, control and management. Optimisation problems of interest involve those related to size, shape and topology of structures and materials. Optimisation techniques have much to offer to those involved in the design of new industrial products. The development of new algorithms and the appearance of powerful commercial computer codes with easy to use graphical interfaces have created a fertile field for the incorporation of optimisation into the design process in all engineering disciplines. The book addresses the topic of design optimisation with welcomed contributions on numerical methods, different optimisation techniques and new software. Several of the topics covered are: Composite materials and structures; Material characterisation; Experiments and numerical analysis; Transformable structures; Environmentally friendly and sustainable structures; Evolutionary methods in optimisation; Aerospace structures; Biomechanics application and Pneumatic structures.

Proceedings of the 7th International Conference on Industrial Engineering (ICIE 2021)

Ion Beams in Materials Processing and Analysis

Proceedings of the 6th International Conference on Industrial Engineering (ICIE 2020)

Interdisciplinary Process Innovations

Titanium and Titanium Alloys

Official Gazette of the United States Patent and Trademark Office

*This dissertation reports the research results obtained in investigating low pressure plasma coatings for corrosion protection of aluminum ion vapor deposition (IVD) coated high-strength steels and in studying atmospheric non-thermal plasmas for destruction of oral bacteria. The objective of investigating plasma coatings for protection of IVD coated high strength steel is to reduce damage from corrosion and prevent its hydrogen re-embrittlement that often occurs in aircraft. In this study, we completed the design and construction of a hybrid IVD/plasma coater, which has the capability of producing both aluminum IVD coatings and plasma coatings of trimethylsilane (TMS). Both IVD Al coating and TMS plasma coatings were successfully prepared by the hybrid coater. The coating properties of the resulted IVD coating and TMS plasma coating were characterized and evaluated. Corrosion property evaluation using potentiodynamic polarization technique indicated that TMS plasma coated IVD specimens showed a decrease in the magnitude of corrosion potential and a decrease in corrosion current compared to bare IVD, and thus better corrosion resistance. Corrosion test results from SO₂ salt spray test showed that a similar amount of corrosion products were found with the plasma coated IVD specimens as their controls, i.e., chromate conversion coated IVD samples, and did not form visible amounts of red rust after 504 hours neutral salt fog. Hydrogen re-embrittlement testing demonstrated that TMS plasma coated IVD specimens gave better test results as compared with bare IVD samples. This result is believed to be due to the improved corrosion resistance of the TMS plasma coated IVD specimens and thus less amount of hydrogen formation as a corrosion by product. It was further found that IVD Al coating should be exposed to oxygen or air in order to create an oxide layer before organosilane coatings are applied for stronger corrosion resistance. TMS plasma coating did not cause contamination to IVD. Likewise, the application of IVD in the chamber prior to TMS plasma coating does not affect the barrier properties of the TMS plasma coating. To explore the potential application of non-thermal atmospheric plasmas in the dental field, plasma treatment effects using a plasma brush on disinfection of common oral bacteria were studied in terms of bacterial concentration, supporting media, plasma chemistry, and plasma exposure time. In the first set of oral disinfection experiments, Gram-positive oral bacteria *Lactobacillus acidophilus* and *Streptococcus mutans* were seeded on hydroxyapatite disks that were used as a tooth enamel analogue. By altering bacterial seeding density, a physical shadowing effect of bacterial cells was observed. The experimental data indicated that a plasma exposure time of 13 seconds effectively killed all bacteria when concentrations were less than 6.9×10^6 cfu/cm² for *L. acidophilus* and 1.7×10^7 cfu/cm² for *S. mutans*. At higher bacterial concentrations of 1.2×10^8 - 2.5×10^8 cfu/cm², a 1.5 log reduction in bacterial concentration was observed in the first 7 seconds, but nearly no further reduction in bacterial population was achieved after 20 seconds. Deactivation was determined to be caused by physical bombardment by energetic species. The disinfection experiment was repeated on dentin as the supporting media. During the first six seconds, deactivation rates were similar to that as performed on HA. After six seconds, deactivation began to plateau and full disinfection was not achieved. Upon further SEM examination, bacteria were observed within dentin tubules. Plasma treatment was unable to affect these deep lying bacteria. Bacteria were also seeded on glass cover slips held apart to create a microchannel and plasma treatment was performed with electrodes both transverse and in-line to the microchannel. SEM was again performed to examine the location of cell lysis. No disinfection was observed when the plasma treatment was performed with electrodes transverse to the microchannel. Deactivation was observed when plasma treatment was performed in-line with the microchannel. This line-of-sight deactivation result is further evidence that bombarding species*

were the cause of deactivation. These experiments have shown the effectiveness and geometric dependence of plasma deactivation of oral bacteria.

Reviews the science and engineering of high-temperature corrosion and provides guidelines for selecting the best materials for an array of system processes High-temperature corrosion (HTC) is a widespread problem in an array of industries, including power generation, aerospace, automotive, and mineral and chemical processing, to name a few. This book provides engineers, physicists, and chemists with a balanced presentation of all relevant basic science and engineering aspects of high-temperature corrosion. It covers most HTC types, including oxidation, sulfidation, nitridation, molten salts, fuel-ash corrosion, H₂S/H₂ corrosion, molten fluoride/HF corrosion, and carburization. It also provides corrosion data essential for making the appropriate choices of candidate materials for high-temperature service in process conditions. A form of corrosion that does not require the presence of liquids, high-temperature corrosion occurs due to the interaction at high temperatures of gases, liquids, or solids with materials. HTC is a subject of increasing importance in many areas of science and engineering, and students, researchers, and engineers need to be aware of the nature of the processes that occur in high-temperature materials and equipment in common use today, especially in the chemical, gas, petroleum, electric power, metal manufacturing, automotive, and nuclear industries. Provides engineers and scientists with the essential data needed to make the most informed decisions on materials selection Includes up-to-date information accompanied by more than 1,000 references, 80% of which from within the past fifteen years Includes details on systems of critical engineering importance, especially the corrosion induced by low-energy radionuclides Includes practical guidelines for testing and research in HTC, along with both the European and International Standards for high-temperature corrosion engineering Offering balanced, in-depth coverage of the fundamental science behind and engineering of HTC, *High Temperature Corrosion: Fundamentals and Engineering* is a valuable resource for academic researchers, students, and professionals in the material sciences, solid state physics, solid state chemistry, electrochemistry, metallurgy, and mechanical, chemical, and structural engineers.

The Proceedings of the workshop *Advanced materials for technical and medical purpose* (AMTMP-2016 was organized by Institute of High Technology Physics and held on February 15-17, 2016 in Tomsk Polytechnic University, Tomsk, Russia) covers the research works and technologies aimed at the treatment of materials and deposition of coatings, design of new-generation composites, additive manufacturing of metallic and non-metallic articles, materials for biomedical application. The workshop was targeted at sharing of opinions and discussion the problems existing in the areas and ways of their solution.

Scientific and Technical Aerospace Reports

Volume II

ICIE 2018

Methods for Problem-Solving

Recent Advances in Technology Research and Education

Gravures anciennes et modernes, dessins, gouaches, aquarelles, du XIXe siècle, tableaux anciens, du XIXe siècle et modernes

Thin Film Coatings for Biomaterials and Biomedical Applications discusses the latest information on coatings, including their historic use by scientists who are looking to improve the properties and biological responses of the material-host interface. Thin films, in particular, are becoming more widely researched and used as an alternative to traditional sprayed coatings because they have a more uniform structure and therefore greater stability. This book provides readers with a comprehensive guide to thin film coatings and their application in the biomaterials field. Part One of the book details the fundamentals of thin films for biomedical application, while Part Two looks at the special properties of thin films, with a final section reviewing functional thin films and their usage in biomedical applications. Provides a comprehensive review on the fundamentals, properties, and functions of thin film coatings for biomaterials Covers a broad range of applications for implantable biomaterials Written by an international team of contributors who carefully tailor the presented information in a way that addresses industry needs

Containing the proceedings of three symposia in the E-MRS series this book is divided into two parts. Part one is concerned with ion beam processing, a particularly powerful and versatile technology which can be used both to synthesise and modify materials, including metals, semiconductors, ceramics and dielectrics, with great precision and excellent control. Furthermore it also deals with the correlated effects in atomic and cluster ion bombardment and implantation. Part two deals with the deposition techniques, characterization and applications of advanced ceramic, metallic and polymeric coatings or thin films for surface protection against corrosion, erosion, abrasion, diffusion and for lubrication of contracting surfaces in relative motion.

Metallurgical and Protective Coatings

High Performance and Optimum Design of Structures and Materials II

TRANSBALTICA XII

Advanced Materials for Technical and Medical Purpose