

Table of Contents

Preface

Chapter 1: Materials and Technologies for Hydrogen Production

High-Strength PPS-Polymer Composites for Hydrogen High-Pressure Applications M. Schöbel, M. Langela, T. Koch and A. Pöllinger	3
Damage Accumulation and Recovery Involving Vacancy-Type Defects Enhanced by Hydrogen in Tempered Martensitic Steel Showing Quasi-Cleavage Fracture K. Saito, T. Hirade and K. Takai	11
Hydrogen Embrittlement in as-Quenched Martensitic Steels - Application of Incremental Step Loading Technique with Novel Tuning-Fork Test R. Latypova, T.T. Nyo, J.I. Kömi and S. Pallaspuuro	17
Microstructural Engineering of Mn-Alloyed Austenitic Steel for Hydrogen Storage and Delivery P. Kathayat, L. Cho, J.G. Speer, Y. Kong, C.W. San Marchi, J.A. Ronevich and K.O. Findley	23

Chapter 2: Materials and Technologies for Electronics Industry

Effect of Plating Potential on Three-Dimensional Structural Plating Films and their Adhesion to Epoxy Resin T. Kobayashi, T.A. Pham and I. Shohji	31
Fabrication of High-Temperature Solder by Zn Plating Films Containing Al Particles T. Kobayashi, Y. Abiko and I. Shohji	37
Effect of Sb Addition on Microstructure and Shear Strength of Sn-3.0Ag-0.5Cu Solder Ball Joints M. Oyama, T. Kobayashi, I. Shohji and M.A.A. Mohd Salleh	43
Ion Trajectory Control in Processing Plasmas for Nano-Fabrication H. Otomo, I. Nagao, K. Kamataki and M. Shiratani	51
Optical-Emission Properties of GaN-Based Nanopillar Light-Emitting Diodes Prepared on Non-Polished and Non-Single-Crystalline Substrates Y. Sato, H.Y. Xue, S. Taniguchi, S. Saito, A. Fujiwara and T. Saito	57
Effect of High Temperature and Humidity on Bond Strength of Al/Resin Adhesive Joints I. Watanabe, T. Kobayashi and I. Shohji	63

Chapter 3: Materials for Biomedical Applications

Carbon Dots Release from Biodegradable Coatings Deposited by Aerosol-Assisted Open-Air Plasma G. Morand, P. Chevallier, R. Naccache, M. Tatouliau and D. Mantovani	71
Plasma Immersion Ion Implantation of a Fe-Mn-C Based Steel for Biomedical Applications: Effect of Gases and Treatment Times on the Surface Properties L. Marin de Andrade, P. Chevallier, C. Paternoster, F. Copes and D. Mantovani	79
Neural Network Regressor for Designing Biomedical Low Elastic Modulus Ti-Zr-Nb-Mo Medium Entropy Alloys N.M. Eldabah, A. Shoukry, W.M. Khair-Eldeen, S. Kobayashi and M.A.H. Gepreel	89
Development and Characterisation of New Hydrogels for Medical Science Education S. Speck, C. Verona, A. Böhme and A.H. Foitzik	95
Effects of C Doping on the Structure and Functional Characteristics of Fe-Mn Alloys after Equal Channel Angular Pressing O.V. Rybalchenko, N. Martynenko, G. Rybalchenko, N. Tabachkova, I. Shchetinin, D. Prosvirnin, E. Lukyanova, A. Kolytgin, A. Raab and S.V. Dobatkin	101

Effect of Rotary Swaging on Mechanical and Corrosion Properties of Zn-1%Mg and Zn-1%Mg-0.1%Ca Alloys	
N. Martynenko, O.V. Rybalchenko, G. Rybalchenko, D. Prosvirnin, D. Temralieva, E. Lukyanova, V. Yusupov, A. Sannikov, A. Koltygin and S.V. Dobatkin	107
Improvement of Work-Hardening Behavior of Co-Cr-W-Ni Alloy by Adding Mn/Fe for Balloon-Expandable Stents	
K. Ueki, K. Ueda, M. Nakai, T. Nakano and T. Narushima	115
Status and Challenges in Biomedical Applications of LDHs	
M. Richetta, C. de Crescenzo, R. Narducci, R. Montanari and A. Varone	121
Can Multifunctionality of Bioresorbable BMGs be Tuned by Controlling Crystallinity?	
S.M. Yang, J. Hufenbach, S. Scudino, P.P. Conway and C. Torres-Sanchez	131
Magnesium-Based Biomedical Devices Degradation Control by Means of Multilayer Coatings	
T. Monetta and A. Acquesta	137
Effect of Heat Treatments on Microstructure and Mechanical Properties of Nitinol Prototype Stents Produced by Laser Powder Bed Fusion	
M.B. Abrami, M. Tocci, K. Tamilselvam, D. Brabazon and A. Pola	143
New Powder Metallurgy Titanium Alloys with Built-In Antibacterial Capability	
B. Manogar, L. Peters, F. Yang and L. Bolzoni	151
Binder Based Processing of Magnesium Alloy WE43 towards Biomedical Application Using Metal Injection Molding (MIM)	
M. Wolff, E. Nidadavolu, W. Limberg, T. Ebel and R. Willumeit-Römer	157
Microstructure, Mechanical, and <i>In-Vitro</i> Characterization of a Novel Biodegradable Zinc-Based Composite Fabricated at Room Temperature	
M.M. Castro, M. Balog, P. Křížik, P. Švec Jr., E. Švastová, M. Takáčová and J. Kubásek	165
Interactive Evaluation of Interfacial Damages on Loosening Behavior of Acetabular Cup Loosening Using AE and IR Method	
Y. Otsuka, T. Sakonju and Y. Miyashita	171