

Table of Contents

Preface

Chapter 1: Permanently Implantable Materials. Impact of Chemical Composition and Synthesis Method on Corrosion Properties

Electrochemical Behavior of Hot Treated Ti-12Mo-8Nb Alloy A.R.V. Nunes, S.G. Borborema, L.S. Araújo, C.A. Nunes and L.H. de Almeida	3
Influence of Different pH and Fluoride Addition on the Corrosion Behavior of the Sintered CoCr Alloy Ceramill Sintron Compared to the Cast Alloy Girobond NB C. Schille, E. Schweizer, R. Hoffmann, F. Noack and J. Geis-Gerstorfer	9
Corrosion Resistance of Medical Stainless Steel Obtained by Non-Vacuum Electron Beam Cladding I.V. Ivanov, E.I. Tkachenko and A. Thoemmes	15
Electrochemical Behaviors of Biomedical Nanograined β-Type Titanium Alloys H. Yilmazer, B. Dikici, M. Niinomi, M. Nakai, H.H. Lui, Y. Todaka and A.N. Ozcivan	21

Chapter 2: Permanently Implantable Materials. Anti-Corrosion Coatings and Surface Modification

Corrosion Properties of ECAP Titanium with Bioactive Oxide Coating in Physiological Solution J. Hlinka, L. Dluhoš and K. Dědková	29
Surface Modification of Titanium Implants O. Tkachuk, I. Pohrel'yuk and R. Proskurnyak	35
Surface Plasma Nitriding of Beta-Titanium Alloy Bio-Material D.N. Travessa, A.S. da Silva Sobrinho, A.M. Jorge Júnior and V. Roche	41
Investigations of <i>In Vitro</i> Corrosion, and Wear Properties of TiN PVD Coating on Ti6Al4V Alloy for Dental Application M. Hussein, A. Adesina, M. Kumar, A.A. Sorour and N. Al Aqeeli	47
Electrochemical and Morphological Characterization of Silver Doped Bioceramic Layer on Metallic Implant Materials for Orthopaedic Application M. Furkó, É. Fazakas, E.R. Fábán and C. Balázs	53
Biomineralization of Titanium Alloy with Surface Micro - and Nanoscaled Modifications M.P. Nikolova, S. Valkov, S. Parshorov, E.H. Yankov and P. Petrov	59
Potentiodynamic Polarization and Electrochemical Impedance Spectroscopy Used for Prediction of Nitinol Stent's Lifetime J. Hlinka, S. Lasek and J. Branzovsky	65
Plasma-Immersion Modification of Nitinol Surface with Silicon to Improve the Corrosion Resistance of the Alloy in Biological Media P.V. Abramova, A.V. Korshunov, I.E. Fedorov and A.I. Lotkov	72
Improvement of Corrosion Fatigue Strength for TiNi Shape Memory Alloy K. Yamada and R. Matsui	78
Adhesion and Corrosion of Ti, TiN and TiCrN Films Deposits on AISI 316L in SBF Solution D. Amari, H. Khireddine, Y. Khelfaoui and N. Saoula	83
Development of Novel Poly (-Caprolactone)/ Fluorine Substituted Hydroxyapatite Bilayer Coated 316L Ss for <i>In Vitro</i> Corrosion Protection K. Prem Ananth	95
Influence of Passivation on Wettability of AISI 304 Steel and its Corrosion Properties in Solution of Sodium Hypochlorite J. Hlinka and S. Lasek	120
Microstructure, Hardness, Adhesion and Corrosion Properties of Ti and TiN Films on Stainless Steel 316L K. Wathanyu, T. Karuna, S. Daopiset, S. Sirivisoot and S. Surinphong	126

Assessment of Corrosion Behavior in Artificial Saliva of Wires for Orthodontic Applications	
A. Phukaoluan, A. Khantachawana, P. Kaewtatip and S. Dechkunakorn	136

Chapter 3: Temporarily Implantable Materials. Impact of Chemical Composition and Synthesis Method on Corrosion Properties

The Effects of Biodegradation on the Cytocompatibility of Bioresorbable Fe-Based Scaffolds: A Review	
M. Caligari Conti and D.A. Pollacco	143
A Study on Corrosion Behaviour of Magnesium Alloys	
L.X. Chen, X.J. Wang and W. Li	160
Study on Corrosion Properties of Medical Mg-Zn Alloy	
Z.L. Wang	167
Structure, Mechanical Properties and Corrosion Resistance of MgCa5 and MgCa5Zn1 Alloys after Plastic Deformation	
R. Nowosielski, A. Gawlas-Mucha and R. Babilas	172
AZ31 and WE43 Alloys for Biomedical Applications	
D. Dvorský, J. Kubásek and D. Vojtěch	182
Effect of Multiwalled Carbon Nanotubes (MWCNTs) on the Micro-Hardness and Corrosion Behaviour Mg-Zn Alloy Prepared by Powder Metallurgy	
N. Darsono, M. Handayani, F.P. Lestari, A. Erryani, I.N.G. Putrayasa, Y.N. Thaha, Y.I. Sihaloho and H. Sutanto	189

Chapter 4: Temporarily Implantable Materials. Anti-Corrosion Coatings and Surface Modification

Electrochemical Impedance Spectroscopy (EIS) Evaluation of Hydroxyapatite-Coated Magnesium in Different Corrosion Media	
M.A.F. Zaludin, Z.A.Z. Jamal, M.N.B. Derman and M.Z. Kasmin	199
Novel Strontium Doped Zinc Calcium Phosphate Conversion Coating on AZ31 Magnesium Alloy for Biomedical Applications	
P. Amaravathy and T.S. Sampath Kumar	204
Effect of Crystalline Calcium Phosphate Coatings Prepared in an Aqueous Solution on Corrosion Resistance of Bioabsorbable Magnesium Alloy	
S. Watanabe, T. Yabutsuka and S. Takai	215
Investigation on the Anticorrosion Property of the MnCaP Coating on a Mg-Zn-Ca Alloy	
S.H. Chang, Z.Y. Xu, L.Y. Niu, W. Huang, Z.X. Zhao and D. Nie	222
Influence of the Electrolyte Composition on the Corrosion Behavior of Anodized AZ31B Magnesium Alloy	
L.A. de Oliveira and R.A. Antunes	228
The Improvement of Durability of Biodegradable Magnesium Alloy by Using Bio-Inspired Coating	
A. Acquesta, A. Carangelo and T. Monetta	234