

Table of Contents

Preface

Chapter 1: Corrosion and Corrosion Protection

High-Temperature Corrosion of NiCrAlY/YSZ Coatings in Ar-1%SO₂ Gas P. Yadav, M.A. Abro and D.B. Lee	3
Corrosion-Mechanical Properties of Multifunctional Composition "Steel-Material with a Shape Memory Effect" Z. Blednova, P.O. Rusinov, M.A. Stepanenko and A.N. Tarbin	7
The Influence of Alloying Elements with Shape Memory Effect on Corrosion-Mechanical Properties of Welded Joints Z. Blednova, I.S. Myshevsky, Y.G. Blednov and K.A. Zverkov	13
Voltammetric and Chronopotentiometric Study of Nonstationary Processes at the Oxygen-Evolving Anodes in KF–NaF–AlF₃–Al₂O₃ Melt A. Suzdaltsev, A. Khramov, V.A. Kovrov, O. Limanovskaya, V. Nekrasov and Y. Zaikov	19
Hydrogen Aggressive Media Impact on Cycling Durability of Structure Components D.L. Kishlakov, P.V. Tarakanov, G.V. Shashurin and Y.V. Berchun	27
The Influence of Sodium Molybdate on the Rate of Corrosion of Aluminum in Phosphoric(V) Acid P. Kwolek, K. Dychtoń, J. Szydelko, A. Gradzik, M. Drajewicz and J. Sieniawski	31
Characteristics of the Al-Brasses Affected Corrosion Properties T. Liptáková, M. Lovíšek and B. Hadzima	38
The Effect of Corrosion in Hank's Solution on the Bending Stiffness of Bars from Sintered Iron-Manganese Alloys M. Kupková, M. Hrubovčáková and M. Kupka	46
Innovative Solutions from the Field of the Material Science and Medicine in the Interior of Modern Ambulances M.A. Hajduga, S. Węgrzynkiewicz, J. Waś-Solipiwo, M. Hajduga and M.B. Hajduga	50
Detection of pH Increase at the Surface of Cathodically Polarized Metal by Means of Amphoteric Metals Activation M. Kouril, A. Palffy, J. Hruska, P. Novak and Š. Msallamová	55
Case Studies from Industrial Failures P. Bernasovský, P. Brziak, J. Orszaghová, A. Košinová, M. Paľo and A. Petránová	59
Explosions Caused by Corrosive Gases/Vapors J. Skřínský, J. Vereš, J. Trávníčková and A. Dalecká	65

Chapter 2: Measurement, Assessment and Prediction of Corrosion Rate

Prediction of Materials and Coating Durability Based on Atmospheric and Laboratory Tests K. Kreislova, L. Mindos, H. Geiplova and M. Parakova	75
Evaluation of Long-Term Exposed Structures and their Maintenance H. Geiplova, K. Kreislova, L. Mindos and L. Turek	79
Impact of Air Pollution and Climate Conditions on Carbon Steel in Slovak Republic M. Ivašková, P. Koteš and S. Dundeková	83
Influence of Reinforcement Corrosion on Reliability and Remaining Lifetime of RC Bridges P. Koteš, J. Vican and M. Ivašková	89
Cloud Applications Performance in Crack Growth Simulations of Pre-Hydrogenated Structure Components D.L. Kishlakov, P.V. Tarakanov, G.V. Shashurin and Y.V. Berchun	97
Effective Alarm Model Using Non Invasive Corrosion Monitoring for Risk Assessment of Underground Pipelines M. Halama, M. Smatana, M. Groško, A. Hajšel, A.M. Ardevol and S. Geleva	103

Analysis and Comparison of Calculation Methods for Release of Corrosive Gases M. Skřínská, J. Skřínský, V. Sluka, M. Pražáková, S. Malý, L. Frišhansová and J. Senčík	106
---	-----

Chapter 3: Methods of Surface Treatment of Materials and Structures

Grey Anodizing of a Grade 5 Titanium Alloy: Study of Process Parameters L. Pezzato, K. Brunelli and M. Dabalà	115
Increase in Corrosion Resistance of Commercial Pure Titanium by Anode Plasma Electrolytic Nitriding P.N. Belkin, S.A. Kusmanov, V.S. Belkin and V.I. Parfenyuk	125
Effect of Regimes of Anode Plasma Electrolytic Carburizing on Tribological Properties of Titanium Alloy VT 20 M.R. Komissarova, I.G. Dyakov and Y.P. Gladii	133
Electrolytic Aluminizing of Low Carbon Steel as Protection Treatment for Current Leads against High Temperature Oxidation V.A. Kovrov, V. Tsvetov, Y. Zaikov, A.R. Mullabaev and P.A. Pyankov	141
Plasma Electrolytic Hardening and Nitrohardening of Medium Carbon Steels P.N. Belkin, S.A. Kusmanov and A.A. Smirnov	146
Rice Husks - Structure, Composition and Possibility of Use them at Surface Treatment M. Fijalkowski, K. Adach, A. Petráň and D. Kroisová	153

Chapter 4: Coatings

The Influence of Cutting Metal Elements on the Structure and Corrosion Resistance of the Zn Coating S. Węgrzynkiewicz, J. Waś-Solipiwo, M. Hajduga, M.A. Hajduga and M.B. Hajduga	159
Ni-W Alloys for Hydrogen Evolution M. Zemanová, J. Druga, J. Szúnyogh and E. Dobročka	167
The Microstructure of Hafnium Modified Aluminide Coatings Deposited by CVD Method M. Góral, M. Pytel, R. Filip and A. Nowotnik	172
The Influence of Surface Preparation Method on Microstructure of HF-Modified Aluminide Coatings Deposited by CVD Method on Rene 80 and MAR M-247 Nickel Superalloys R. Filip, M. Pytel and A. Nowotnik	177
The Influence of LPPS Process Parameters on Porosity and Microstructure of MCrAlY Coatings T. Kubaszek, M. Pytel and M. Góral	181
The Influence of Ar/N₂ Plasma Gases on Microstructure of Ceramic Coatings Produced by PS-PVD Method P. Pędrak, M. Góral, K. Dychtoń, T. Kubaszek, A. Nowotnik and K. Kubiak	187
The Influence of Overaluminizing on TGO Formation on CMSX-4 Nickel Superalloy during Isothermal Oxidation M. Góral	193