# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preface</td>
<td>iii</td>
</tr>
<tr>
<td><strong>Passivity</strong></td>
<td></td>
</tr>
<tr>
<td>Enhancement of Corrosion Resistance of Amorphous Aluminum Alloys by</td>
<td>1</td>
</tr>
<tr>
<td>Alloying Additions</td>
<td></td>
</tr>
<tr>
<td><em>E. Akiyama, K. Asami, H. Habazaki, A. Kawashima, and K. Hashimoto</em></td>
<td></td>
</tr>
<tr>
<td>The Passivity of Co in Alkaline Electrolytes Studied by X-Ray</td>
<td>9</td>
</tr>
<tr>
<td>Photoelectron Spectroscopy (XPS)</td>
<td></td>
</tr>
<tr>
<td><em>H.-H. Strehlow and A. Foelske</em></td>
<td></td>
</tr>
<tr>
<td>Extremely Corrosion-Resistant Bulk Amorphous Ni-Cr-Ta-Mo-Nb-5P Alloys</td>
<td>18</td>
</tr>
<tr>
<td>*K. Hashimoto, H. Katagiri, H. Habazaki, M. Yamasaki, S. Meguro,</td>
<td></td>
</tr>
<tr>
<td><em>A. Kawashima, and K. Asami</em></td>
<td></td>
</tr>
<tr>
<td>A View of Passive Films on Metals as Mixed-Conducting Oxides</td>
<td>26</td>
</tr>
<tr>
<td><em>M. Bojinov, P. Kinnunen, T. Laitinen, K. Mäkelä, and T. Saario</em></td>
<td></td>
</tr>
<tr>
<td>Investigations on Passivity of Fe in Borate and Phosphate Buffer, pH</td>
<td>34</td>
</tr>
<tr>
<td>8.4</td>
<td></td>
</tr>
<tr>
<td>*P. Schmuki, I. Kobanenko, H. Hildebrand, I. Wasserman, M. Kolacyak,</td>
<td></td>
</tr>
<tr>
<td>and S. Virtanen</td>
<td></td>
</tr>
<tr>
<td>Modification of Passive Films on Type 304 Stainless Steel by Ultra-Violet</td>
<td>42</td>
</tr>
<tr>
<td>Light Irradiation in Neutral Chloride Solution</td>
<td></td>
</tr>
<tr>
<td><em>S. Fujimoto, T. Shibata, and K. Asami</em></td>
<td></td>
</tr>
<tr>
<td>Effect of Mechanical, Chemical, and Thermal Treatments on the</td>
<td>50</td>
</tr>
<tr>
<td>Repairing of Voids in Re-Anodizing of Aluminum Covered with</td>
<td></td>
</tr>
<tr>
<td>Composite Oxide Films</td>
<td></td>
</tr>
<tr>
<td><em>H. Takahashi, Y. Tamura, M. Sakairi, and H. Uchi</em></td>
<td></td>
</tr>
<tr>
<td>Study of Cr Based and Cr-Free Films on Al Surfaces: A Complementary</td>
<td>58</td>
</tr>
<tr>
<td>Approach</td>
<td></td>
</tr>
<tr>
<td><em>P. Laha, T. Schram, and H. Terryn</em></td>
<td></td>
</tr>
<tr>
<td>Homogeneous Pit Nucleation on High-Purity Aluminum</td>
<td>65</td>
</tr>
<tr>
<td><em>F.D. Wall and M.A. Martinez</em></td>
<td></td>
</tr>
<tr>
<td>The Influence of Selected Organic Solvents on the Passivity and</td>
<td>73</td>
</tr>
<tr>
<td>Breakdown of Common Alloys</td>
<td></td>
</tr>
<tr>
<td><em>D.A. Shifler and J. Kruger</em></td>
<td></td>
</tr>
</tbody>
</table>
The Role of Chromate in Preventing Undermining Coatings on Hot-Dip
Galvanized Steel Surfaces
N. Le Bozec, A. Nazarov, D. Thierry, and H.S. Isaacs

Confocal Scanning Laser Microscopy of the Surface of Anodized
Al5052 Alloy
S.-M. Moon, M. Sakairi, and H. Takahashi

Characterization of Anodic Bismuth Oxide Films
O.E. Linares Pérez, V.C. Fuertes, M.A. Pérez, and M. López Teijelo

Electroformation and Growth of Salt Films on Lead
L.V. Antonini and M. López Teijelo

Al2O3 Passivation Film on Austenitic Stainless Steel Free from Plasma
Damage
M. Kitano, M. Nagase, Y. Shirai, and T. Ohmi

Preparation and Corrosion Resistance of Fe-Cr-Mo-C-B-P Bulk Glassy Alloys
K. Asami, S.-J. Pang, T. Zhang, and A. Inoue

Corrosion Behavior of Copper-Mold Cast and Sheath-Rolled Ni-Cr-Nb-P-B
Bulk Amorphous Alloys in HCl Solutions
H. Habazaki, Y. Naruse, H. Konno, H. Ukai, K Izumiya, and K. Hashimoto

Characterization of Sealed Anodic Layers on 7050 T74 and 2214 T6
Aluminum Alloys
F. Snogan, C. Blanc, G. Mankowski, and N. Pébère

Anodizing of Aluminum Covered with SiO2 by Sol-Gel Coating – Formation
Mechanism of Composite Oxide Films with High Potential Sustainability

Film Breakdown and Localized Corrosion

Nano-Mechano-Electrochemical Aspect of Passive Metal Surfaces
M. Seo, M. Chiba, and Y. Kurata

High Resolution Localized Corrosion Studies
T. Suter and H. Böhni

Stochastic Aspects of Pit Initiation at Passive Iron
K.E. Heusler
Investigations of Defects in Protective Films with Optical and Electrochemical Functional NSOM Techniques

J.K. Evju and W.H. Smyrl

Effects of Nitrogen on the Metastable Pitting and Repassivation Behavior of Austenitic Stainless Steels in Chloride Solution

J.W. Park and H.S. Kwon

Corrosion and Passivity Breakdown of High Copper Dental Amalgams

C.M.A. Brett, H.A. Acciari and A.C. Guastaldi

Initiation of Localized Corrosion at the Nanometer Scale

P. Marcus and V. Maurice

Stress Generation During Anodic and Cathodic Polarization of a Titanium Thin Film Electrode in pH 8.4 Borate Buffer Solution

J.-D. Kim, S.-I. Pyun, and M. Seo

A Comprehensive Study of the Metastable Corrosion Pit Growth

B. Malki, L. Peguet, and B. Baroux

Fractal Properties of Electrochemical Noise Records of Aluminum under Different Corrosion Types

A. Sánchez, L. Espada, M. Sanjurio, and S. Urréjola

Transitions in Electrochemical Noise During Pitting Corrosion of Aluminum in Chloride Environments

K. Sasaki, H.S. Isaacs, and P.W. Levy

Parameters for the Identification of Localized Corrosion: Theoretical Analysis

R. A. Cottis

Effects of Magnesium Levels on the Kinetics and Mechanism of Corrosion in Coated Zinc Aluminum Alloy Galvanised Steels

M. Challis, T. Heatley, and D.A. Worsley

Crystallographic Effects in Intergranular Corrosion of an Al-Mg Alloy

Y. Yuan, R. Ambat, M. Strangwood, A.J. Davenport, A. Afseth, and G. Scamans

Combination of Rigorously Controlled Crevice Geometry and Computational Modeling for the Study of Crevice Corrosion Scaling Factors

J.S. Lee, M.L. Reed, and R.G. Kelly
Orientation Dependence and Bonding During Pitting Corrosion of HCP Metals
   
   R. S. Lillard

Application of PPR and CPT Tests to Study the Pitting Resistance of Stainless Steels
   
   J.-B. Lee and S.-W. Kim

Non-Linear Dynamical Behavior Observed during Late Stages of Localized Corrosion of Iron in Chloride-Containing Sulfuric Acid Solutions
   
   D. Sazou and M. Pagitsas

Modification of the Pitting Corrosion Resistance of 316L Stainless Steel by Laser-Peening and Shot-Peening
   
   C. Carboni, P. Peyre, G. Beranger, and C. Lemaitre

Susceptibility to Local Breakdown of Passive Film Formed on Iron
   
   K. Fushimi and M. Seo

Influences the Nature of Aggressive Anions on Corrosion Copper Resistance in Bicarbonate Solutions Under Heat-Transfer and Elevated Temperatures
   
   S.A. Kaluzhina, I.V. Kobanenko, and V.V. Malygin

A Current Transient Analysis on the Influence of Mo and Na₂MoO₄ on Pitting Corrosion of Model Fe-Cr Base Alloys
   
   W.J. Tobler and S. Virtanen

General and Pitting Corrosion Deduced from Current Oscillations and Explained in Terms of a Point Defect Model
   
   M. Pagitsas, A. Diamantopoulou, and D. Sazou

Localized Corrosion Characteristics of Ultra High Nitrogen-Bearing Austenitic Stainless Steels in Artificial Seawater
   
   M. Sagara, Y. Katada, and T. Kodama

Repassivation Kinetics of Fe-20Cr-xNi Alloys (x=0−80 wt.%) and Its Relation To Stress Corrosion Susceptibility
   
   E.A. Cho and H.S. Kwon

Electrochemical Noise of Different Steel Alloys Under Passivity, Pitting Corrosion and Generalized Corrosion Conditions
   
   A. Sánchez, L. Espada, F. Bouzada, M. Sanjurjo, S. Urréjola and G. Rey
Adsorption, Inhibition, and Film Formation

Radiotracer Study of the Adsorption of Corrosion Inhibitors on Oxide Surfaces Modeling the Products of Metal Corrosion
G. Horányi and E. Kálmán

Surface Modification of Iron by Self-Assembly of Phosphonates
I. Felhösi, Z. Kersztes, and E. Kálmán

Deposition of Inhibiting Anions on Aluminum
A.S. Besing, P. Waszczuk, A. Kolics, and A. Wieckowski

Microbiologically Influenced Corrosion Inhibition due to Bacterial Contamination
A. Nagiub and F. Mansfeld

CR(VI) and Ce(III) Inhibition of Oxygen Reduction on Copper
M. Kendig and S. Jeanjaquet

Influence of the Microstructure on the Nucleation and Growth of Chromate Conversion Coatings on Aluminum Alloys
P. Campestrini, E.P.M. van Westing, and J.H.W. de Witt

Composition of Chromate Conversion Coatings Formed on Multi-Layered Thin Films of AA2024-T3 Matrix and Al₂Cu, Al₂CuMg, and Al₂₀Cu₂(MnFe)₃
M.J. Vasquez, C.R. Clayton, and G.P. Halada

Efficiency of Pitting Corrosion Inhibitors on AA2024-T3 Quantified Using Numerical Integrated SVET Data
S. O’Driscoll, H.N. McMurray, and P.C. Morgan

Inhibition of the Pitting Corrosion of 2024 Alloy by 1,2,3-Benzotriazole
C. Blanc, W. Qafsaoui, M.G. MacCarthy, and G. Mankowski

Characterization of Films Developed on Copper in Presence of Different Triazole Derivative Inhibitors
W. Qafsaoui, C. Blanc, N. Pébère, H. Takenouti, and G. Mankowski

Samarium Salts as Corrosion Inhibitor Species for Metals in Aqueous Solution
L.A. Godinez, I.H. Del Ángel, D. Beltrán, R. Ortega, Y. Meas, and H. Sánchez
Microelectrochemical Quantification of Drag Reducing Properties of Corrosion Inhibitors
G. Schmitt and C. Werner

Nontoxic Corrosion Inhibitors for Copper in Sulfuric Acid
E. Stupnišek-Lisac, A. Gazivoda, and M. Madžarac

Chromate Inhibition of the Localized Corrosion of Aluminum: Measurements of Electrochemical Transients
K. Sasaki and H.S. Isaacs

Formation of Chromate Conversion Coatings on Aluminum and its Alloys: An in-Situ XANES Study

Influence of Ni on Phosphating of Zinc-Coated Steel
D. Zimmermann, A.G. Muñoz and J.W. Schultze

Protective Properties of Zinc-Rich Paints
F. Molnár and J. Liszi

Protection by Polymer Films

PANI/SPANI Copolymer for the Protection of Iron Against Corrosion
M.C. Bernard, A. Hugot-Le Goff, and S. Joiret

Polyaniline Based Acrylic Blends for Iron Corrosion Protection
S. de Souza, R. Torresi, J.E. Pereira da Silva, S.I. Córdoba de Torresi, and M.L.A. Temperini

Comparison of Polyaniline and Poly(Ortho-Ethoxyaniline) Corrosion Protection Properties
M. Kralj, Z. Mandic, and L. Duić

The Dipolar and Conductivity Relaxations of Epoxy Coating Studied by EIS in Aqueous Solution
S. Duval, M. Keddam, M. Sfaira, A. Srhiri, and H. Takenouti

Investigation of Pitting Phenomena Beneath Multi-Layer Polymeric Coatings
L. Keene, C.R. Clayton, G.P. Halada, K. Kovaleski, D. Dumsha, S. McKnight, and W. Kosik
Epoxy Adhesion to Hydrotalcite: Correlation Between Contact Angle and Electrokinetic Measurements
R.B. Leggat and S.R. Taylor

Protective Property of Conductive Polyaniline Coating Derived from Its Dispersion
S. Karthikeyan, S. Shriram, S. Pitchumani, S. Mohan, D. Kanagaraj, and V. Raj

Corrosion Protection by Surface Modification with Conducting Polymer Based Films
P.J. Kulesza, K. Miecznikowski, M.A. Malik, M. Galkowski, R. Widarczyk, and H. Bala

Composite Oxide/CP or Large Size Anions/CP Films as Active Protective Coatings. Case of Polypyrrole
C. Deslouis, B. Garcia-Renaud, and N.T.L. Hien

Corrosion Protection by Films of Intrinsically Conducting Polymers
U. Rammelt, P.T. Nguyen, and W. Plieth

Corrosion Protection of Aluminum Alloy 2024-T3 by Multilayers of Polyaniline
D. Huerta, S.R de Moraes, and A.J. Motheo

Scanning Kelvin Probe Force Microscopy – Chances and Limitations for in Situ Delamination Measurements
E. Hornung, M. Rohwerder, and M. Stratmann

Electroactive Poly(Aromatic Amine) Films for Iron Protection in Sulfate Medium
A. Meneguzzi, M.C. Pham, J.C. Lacroix, B. Piro, A. Adenier, B. C.A. Ferreira, and P.C. Lacaze

Investigations of the Redox Mechanism of Poly(5-Amino-2-Methyl-1,4-Naphthoquinone) (PAMNQ) Film
S. Hubert, B. Piro, M.C. Pham, and L.H. Dao

High Temperature Corrosion and Reliability of Electronic Materials and Devices

Interactions of High-Temperature Coatings in Hot Corrosion Environments
D.A. Shifler
Thermal Oxidation of III-V Materials and Heterostructures

645

Chemical Vapor Deposition of Silicon Dioxide, Aluminum Oxide, and Mullite from Mixtures of Aluminum Trichloride, Chlorosilane, Carbon Dioxide, and Hydrogen
S. F. Nitodas and S.V. Sotirchos

655

Proposal of Novel Cobalt-Palladium Media Controlled with C or Si Underlayer for Ultra High Density Magnetic Recording
T. Osaka, T. Onoue, and T. Asahi

663

The Use of Titanium as a Corrosion Barrier in Discrete Power MOSFET Device Automotive Reliability Testing
J. Cumbo, R.S. Ridley, and S. Tetlak

675

Evolution of Al Corrosion at Engineered Cu Islands
N. Missert, R.G. Copeland, J.C. Barbour, and J. Mikkalson

686

Environmental/Reliability Evaluations at Telecommunications Equipment Installations in Eastern Asia

691

Predicting the Effects of Corrosion on the Performance of Electrical Contacts

706

Development of Wide Range EIS Capacitor pH Sensor Using Corrosion Resistant Al₂O₃-Ta₂O₅ and Al₂O₃-ZrO₂ Thin Films as Insulator Layers
K. Sugimoto, S. Yoshida, N. Akao, and N. Hara

714

Atmospheric Corrosion

A Holistic Model of Atmospheric Corrosion

722

In Situ Studies of Initial Atmospheric Corrosion of Iron. Influence of SO₂, NO₂, and NaCl
J. Weissenrieder, J. Österman, and C. Leygraf

733
The NaCl-Induced Atmospheric Corrosion of Aluminum: the Influence of Carbon Dioxide and Temperature


A Mechanistic Study of the Effect of Environmental Conditions in China, South-East Asia and Australia on the Corrosion of Zinc and Steel


Atmospheric Corrosion Process of Low Alloy Steels Under Seashore Environment

_K. Noda, M. Yamamoto, H. Masuda, and T. Kodama_

The Conception of Creation of the Few-Component Oil-Based Conservation Materials Against Steel Atmospheric Corrosion

_L.E. Tsygankova, V.I. Vigdorovitch, and N.V. Shell_

Application of AC Impedance Method to Corrosion Rate Monitoring of Carbon Steel Under Outdoor Environment

_H. Katayama, M. Yamamoto, A. Tahara, and T. Kodama_

Ion Selective Permeability of Rust Layers Formed by Corrosion Cycle Tests and Exposure Tests

_K. Noda, T. Nishimura, H. Masuda, and T. Kodama_

**General**

Photo-Induce Corrosion of Zn-Containing Alloys

_C.B. Breslin, A.L. Rudd, and S.T. Farrell_

Impedance of Corrosion Related Electrode Processes. New Insight in the Origin of the Time Constants from Coupling Effects with the Double Layer

_R. Antaño-López, M. Keddam, and H. Takenouti_

Deconvolution of Complex AC Potential Differences in Solution at an Electrode by Application of FFT

_D. Taxén, D. Thierry, and H.S. Isaacs_

Electrochemical Quartz Crystal Microbalance Study of Corrosion of Phases in AA2024-T3

_Y. Baek and G.S. Frankel_


Corrosion of Admiralty Brass in Ultra-Pure Water Measured by Means of AFM and Solution Analysis
P.A. Zhidan and J.E. Castle

In Situ Investigations on Chemical and Electrochemical Dissolution of Oxide Films on Titanium
S. Virtanen, S. Kurz, and Y. Mueller

Depassivation Behavior of Titanium Alloys in Strong Alkaline Aqueous Solutions
Y. Fukaya and M. Akashi

Wear Corrosion Study of Nanostructured Composite Coatings Obtained by Electroplating
L. Benea, P.L. Bonora, A. Borello, S. Martelli, F. Wenger, P. Ponthiaux, and J. Galland

Local Wall Shear Stress Gradients in Slug Flow from Current Noise Data at Microelectrodes
G. Schmitt, C. Bosch, P. Plagemann, and K. Moeller

Effect of Lead on Anodic Behavior of Aluminum
Y.W. Keuong, J.H. Nordlien, S. Ono, and K. Nisancioglu

Filiform Investigations on Aluminum Alloy 2024-T3
J. Vander Kloet, W. Schmidt, A.W. Hassel, and M. Stratmann

Chromate Inhibition of Filiform Corrosion on Organic Coated AA2024 T3 Investigated Using a Scanning Kelvin Probe
H.N. McMurray, G. Williams, and S. O’Driscoll

Investigation of Filiform Corrosion on Coated Aluminum Alloys by FTIR Microspectroscopy and Scanning Kelvin Probe
N. Le Bozec, D. Persson, A. Nazarov, and D. Thierry

Corrosion of WTiN Sputter-Coated Steels in Chloride Solution: Influence of the Steel Substrate
C.M.A. Brett, V.A. Alves, and A. Cavaleiro

Electrochemical Behavior of the Active Surface Layer on Rolled Aluminum Alloy Sheet
R. Ambat, A. Davenport, A. Afseth, and G. Scamans
Microelectrochemical Characterization of Corrosion Behavior of Mg Alloys: Microstructural, Aging and Inhibiting Aspects
P. Schmutz, K. Lips, S. Virtanen, and P.J. Uggowitzer

Evaluation of Protective Strategies Used for Protecting Steel in Concrete
L. Soto, B.S. Haran, B.N. Popov, and R.E. White

Influence of Hydrogen in Some Alloys on Aqueous- and Gaseous Corrosion
D. Wallinder, E. Hörnlund, and G. Hultquist

Applied Electrical DC-Potential as a Flow Improvement. A Study by Chemometric Inter-Calibration
M. Waskaas, I.H. Hedvig, and K.H. Esbensen

An Insight into in-Situ Interactions Through ex-Situ Methods
S. Rajendran, S. Vaibavi, N. Anthony, and D.C. Trivedi

Influences of Temperature and Heat-Transfer on Anodic Behaviour of Copper in Bicarbonate-Thiocyanate Solutions
I.V. Kobanenko and S.A. Kaluzhina

XPS Study of Stainless Steels in Physiological Solution Containing Complexing Agent
I. Milošev and H.-H. Strehblow

The Kinetic Particularities of Anodic Dissolution of Cu-Au and Ag-Au Alloys at the Potentials of Monochloride Formation
S.N. Grushevskaya, T.A. Kuznetcova, and A.V. Vvedenskii

Total Internal Reflection Ellipsometry – a Tool for in Situ Corrosion Studies
M. Poksinski, H. Dzuho, and H. Arwin

AFM and SEM Characterization of the Microstructure of AA7075-T6
F. Andreatta, J.R. Flores, E.P.M. van Westing, and H.H.W. de Wit

Transpassive Dissolution of Nickel-Base Alloys in Acidic Solutions

Effect of Carbon Deposits on the Corrosion Behavior of Anodized 2214 T6 Aluminum Alloy
F. Snogan, C. Blanc, N. Pëbère, N. Le Pottier, A. Viola, and G. Mankowski
Study of Mild Steel Corrosion in a Na₂SO₄ Electrolyte by Electrochemical Noise Measurements: Analysis of Data by Chaos Theory
S. Arzola-Peralta, G. Vázquez-Coutiño, M. Palomar-Pardavé, M. Romero-Romo, and J. Genescá-Llongueras

Determination of Tafel Lines
T. Hemmingsen, H. Hovdan, P. Sanni, and N.O. Aagotnes

Effect of the Redox Potential in an Electrolyte on Weld Corrosion
T. Hemmingsen, H. Hovdan, P. Sanni, and N.O. Aagotnes

Modeling of Micro-Scale Galvanic Reaction for Cathodic Protection
M. Alodan

Application of Resistometry to the Corrosion Study of Metals
K. Azumi, T. Ueno, K. Iokibe, and M. Seo

Wavelet Analysis of Electrochemical Noise Records
A. Sánchez, S. Urréjola, L. Espada, F. Bouzada, G. Rey, and M. Sanjurjo

Corrosion behavior of Nanocrystalline Al-Mg-Based Alloys
X.J. Wei, E. Sikora, and B.A. Shaw

Effect of Anion, pH, and Temperature on the Dissolution Behavior of Aluminum Oxide Films
H. Lee and H.S. Isaacs

A Comparative Study of Corrosion Behaviour of DC and Pulse Anodized AA2024 Alloy
S. Mohan, D. Kanagaraj, V. Raj, S. Vincent, N.G. Renganathan, and S. Raman

Electrochemical Noise Measurements of Aluminum Alloys in Chloride Solutions
A.H. De Armond, D.D. Davis, and H.D. Beeson

Chemical Heterogeneities in AA4024: Dioxygen Reduction as a Probe of Removal of Cu-Rich Inclusions Via Chemical Etching
J. Seegmiller, Y. Kondratenko, G. Chen, and D.A. Buttry

Effects of Current Density and Temperature on the Morphology and Electric Properties of Anodic Films on Aluminum
S. Ono, F. Mizutani, M. Ue, and N. Masuko
Investigation of Surface Characteristics of Magnesium Alloy MP-1 In Sulphate-Containing Electrolytes by XPS

An Electrochemical Framework to Explain the Intergranular Stress Corrosion Path of Two Al-Cu-Mg-Ag Alloys
D.A. Little, B.J. Connolly, and J.R. Scully

Subject Index