

## TABLE OF CONTENTS

PREFACE.....	iii
<b>Initiation Events of Localized Corrosion / Breakdown of Passivity</b>	
Pit Initiation at Single Sulfide Inclusions on Stainless Steel ..... <i>T. Suter, H. Böhni, J. R. Gray, J. Alameda, and R. C. Alkire</i>	1
Breakdown of Passivity and Pitting Corrosion - Nanoprocesses of Low-Dimensional Systems (LDSs)..... <i>W.J. Lorenz and W. Wiesbeck</i>	16
The Effects of Chloride Implantation on Pit Initiation in Aluminum ..... <i>F. D. Wall, C. M. Johnson, J. C. Barbour, and M. A. Martinez</i>	37
Pit Initiation During Anodic Etching of Aluminum..... <i>K. Muthukrishnan, and K. R. Hebert</i>	46
Pit Nucleation Events and Compositional Thresholds in the Pitting of Iron-Chromium Thin Films..... <i>M. P. Ryan, D. S. Crouch, S. Virtanen, P. Schmutz, T. Suter, and N.J. Laycock</i>	56
Local Breakdown of Anodic Oxide Films on Aluminum Contacting with Solid Electrolytes..... <i>M. Yamada, M. Sakairi, H. Takahashi, K. Nogami, and H. Uchi</i>	66
Application of Various Methods for a Better Understanding of Breakdown of Passivity and Localized Corrosion over the Years..... <i>H.-H. Strehblow</i>	78
Pore Formation as a Parallel Process to Pitting of Aluminum at Moderate Chloride Concentrations..... <i>K. R. Zavadil, J. A. Ohlhausen, P. G. Kotula, C. M. Johnson, and J. C. Barbour</i>	94
Influence of Thickness of 2-5 nm Thick Overcoats of Diamond-Like Carbon on the Rates of Electrochemical Reduction Reactions on Magnetic Hard Disks..... <i>S. Jung, C.S. Kumai, and T. M. Devine</i>	105
Electrochemical Measurements of Low Level Metal Release from AISI 304 Stainless Steel into Potable Water..... <i>B. K. Lee and A. J. Davenport</i>	117
<b>Propagation of Localized Corrosion Processes</b>	
Applications of Segmented Electrodes in Studies of Al Pitting and Surface Preparation..... <i>H. S. Isaacs and K. Sasaki</i>	125

Origins of Persistent Interaction Among Localized Corrosion Sites.....	133
<i>N. D. Budiansky and J. R. Scully</i>	
Sequential Events in the Pitting of Aluminum in Chloride Solutions.....	147
<i>E. McCafferty</i>	
Intergranular Corrosion Morphology and Growth Kinetics in High Strength Aluminum Alloys.....	159
<i>X. Zhao, T. Huang, G. S. Frankel, B. Zoofan, and S. I. Rokhlin</i>	
Pitting Propagation Measurements in Experimental 6XXX Alloys.....	168
<i>B. A. Shaw, M. M. McCosby, E. Sikora, J. Sikora, A. Shi, A. Abdalla, and H. Pickering</i>	
The Impact of the Carbon Dioxide System on the Cathodic Kinetics within Aircraft Lap Splice Joints.....	176
<i>K. S. Ferrer and R. G. Kelly</i>	
Critical Conditions for Stability of Pits in Aluminum: A Contribution to the Mechanism of Tunneling Corrosion.....	187
<i>A. B. Cook and R. C. Newman</i>	
The Induction Period prior to Crevice Corrosion in Iron: The $IR > \Delta\phi^*$ Criterion, Cre-Depleted Alloy and MnS Inclusions in Stainless Steel.....	194
<i>A. M. Al-Zahrani and H. W. Pickering</i>	
Corrosion of Mg and Mg Alloys: Influence of Surface Film and Solution Parameters on Initiation and Propagation Mechanisms.....	202
<i>P. Schmutz, K. Lips, M. Heer, P. J. Uggowitzer, and S. Virtanen</i>	
De-alloying of Type 316 Stainless Steel in Hot, Concentrated Sodium Hydroxide Solution.....	214
<i>J. Deakin, Z. Dong, B. Lynch, and R. C. Newman</i>	

### Oxide Films

Oxide-Metal Nanocomposite Artificial Passivation Films Having Self-healing Corrosion Protection Ability.....	228
<i>K. Sugimoto, T. Usami, N. Akao, and N. Hara</i>	
Effect of Oxide Thickness on Electron Transport and Corrosion in Pure Aluminum.....	238
<i>J. P. Sullivan, K. R. Zavadil, and J. C. Barbour</i>	
Lead Segregation at Oxide-Covered Surface of Binary AlPb Model Alloy.....	250
<i>Y.-D. Yu, O. Saevik, J.T.B. Gundersen, J.H. Nordlien, and K. Nisancioglu</i>	
Passive Film Characterization on Aluminum by Impedance Spectroscopy.....	257
<i>G. T. Cheek, F. J. Martin, W. E. O'Grady, and P. M. Natishan</i>	
Theoretical Analysis of Hydrogen Effects on the Ion Distributions in Passive Films on Iron and Low Carbon Steel.....	267
<i>Y.M. Zeng, J.L. Luo, and P.R. Norton</i>	

Stability of Passive Films on Fe-18Cr Alloys with Various Additive Elements..... 277  
*S. Fujimoto, H. Tsuchiya, T. Shibata, and K. Asami*

The Structure and Growth of Passive Films on Iron, Chromium and Iron-Chromium Alloys..... 284  
*J.R. Mackay, S. Hendy, N.J. Laycock, M.P. Ryan, M.F. Toney, and L.J. Oblonsky*

### Microstructural Effects

Localized Corrosion of an Al<sub>90</sub>Fe<sub>5</sub>Gd<sub>5</sub> Alloy as a Function of Devitrification..... 295  
*A. M. Lucente, G. J. Shiflet, and J. R. Scully*

Electrochemical Characterization of Cu-Bearing Intermetallic Compounds and Localized Corrosion of Alloy 2024..... 310  
*R. R. Leard and R. G. Buchheit*

Nanocrystalline Heterogeneity Responsible for Localized Corrosion..... 318  
*K. Hashimoto, S. Meguro, H. Habazaki, and K. Asami*

Localized Corrosion of Nanocrystalline Al-Mg-based Alloys in Chloride Containing Solutions..... 328  
*E. Sikora and B. A. Shaw*

Pitting Corrosion of Stainless Steels: The Importance of Being a Metallurgist..... 335  
*B. Baroux, D. Gorse, and R. Oltra*

Correlation Between Localized Corrosion, Hardness and Microstructure in a 7075-T6 Friction Stir Weld..... 347  
*C. S. Paglia, M. C. Carroll, A. P. Reynolds, and R. G. Buchheit*

Effect of Impurities on Interfacial Void Formation in Aluminum..... 359  
*R. Huang and K. Hebert*

### Novel Approaches: Techniques And Modeling

Measurement of Corrosion Dynamics Using Scanning Electrochemical Microscopy..... 368  
*T. E. Lister and P. J. Pinhero*

Microcell Applications on Different Systems..... 377  
*T. Suter, A. Spiegel, and H. Böhni*

Nanolithographical Electrochemical Copper Deposition..... 391  
*L. Staemmler, T. Suter, and H. Böhni*

Repairing of Oxide Films on Zn - 55%Al Alloy Coated Steel After Removal with Photon Rupture in Solutions..... 399  
*M. Sakairi, K. Itabashi, and H. Takahashi*

Application of Scanning Chemical Microscope for Crevice Corrosion Process of Stainless Steel..... 411  
*M. Sagara, K. Noda, Y. Katada, and T. Kodama*

Interactions Among Pitting Sites in Aluminum at Engineered Copper Particles.....	421
<i>N. Missert, R. G. Copeland, F. D. Wall, C. M. Johnson, and J. C. Barbour</i>	
Electron Beam Induced Carbon Deposition used for Writing Corrosion Protection and Surface Patterning.....	429
<i>P. Schmuki, T. Djenizian, I. Sieber, and J.M. Macak</i>	
A New Locally Resolving Electrochemical Sensor: Application in Research and Development.....	436
<i>M. Büchler, C.-H. Voute, and F. Stalder</i>	
Electrochemical Impedance Characterization of Passivity Breakdown on Aluminum.....	445
<i>F. J. Martin, G. T. Cheek, P. M. Natishan, and W. E. O'Grady</i>	
Use of the Autocorrelation Function to Describe Corrosion Topography.....	457
<i>K. S. Ferrer and R. G. Kelly</i>	
A Mathematical Model for the Cathodic Delamination Process of Coatings on Zinc.....	474
<i>K. N. Allahar, K. Ogle, and M. E. Orazem</i>	
The Temperature Dependence of Pitting Corrosion of Stainless Steels.....	490
<i>N.J. Laycock, J. Mackay, S.P. White, and D. Krouse</i>	
Numerical and Experimental Modeling of Localized Corrosion Part I: Numerical Method and Input Parameters.....	502
<i>M. Brem, S. Jäggi, B. Elsener, and H. Böhni</i>	
Numerical and Experimental Modeling of Localized Corrosion Part II: Validation and Application.....	511
<i>M. Brem, S. Jäggi, B. Elsener, and H. Böhni</i>	
<b>Alloying and Environmental Effects</b>	
Prevention of Localized Corrosion of Al2024 by Microorganisms.....	522
<i>F. Mansfeld</i>	
Effect of Temperature and Electrolyte Composition on the Susceptibility of Alloy 22 to Localized Corrosion.....	534
<i>S. D. Day, K. J. Evans, and G. O. Ilevbare</i>	
Indium-induced Localized Corrosion of Aluminium.....	545
<i>C. B. Breslin and K. G. Conroy</i>	
Local Dissolution Processes on Al 2024 in the Presence of Inhibitors.....	555
<i>A. S. Besing , A. Kolics, and A. Wieckowski</i>	
Critical Factors in the Stability of Ti and Ti Alloys.....	563
<i>S. Virtanen and J. Mudry</i>	
Towards the Development of Environmentally-Friendly Corrosion Resistant Coatings For Depleted Uranium-0.75 wt% Titanium Alloy.....	572
<i>C.R. Clayton, D. Chidambaram, D.F. Roeper, and G.P. Halada</i>	

Microelectrochemistry on Inclusions of Austenitic Stainless Steel - Influence of Alloyed Mo and Externally Added Na <sub>2</sub> MoO <sub>4</sub> on Pitting Behavior.....	583
<i>W.J. Tobler and S. Virtanen</i>	
Effects of Impurity Ions on Corrosion Behavior of Steam Turbine Materials for Thermal Power Plants.....	595
<i>M. Hirano, S. Itaba, T. Sakurada, Y. Imaizumi, N. Kawai, H. Hirano, T. Minami, and H. Takaku</i>	
Influences of Hydrodynamic and Thermal Conditions on Copper Depassivation in Hydrocarbonate Solutions.....	598
<i>S. Kaluzhina, I. V. Sieber, and T. Federyakina</i>	
Effects of Self-Assembled Monolayers on Cathodic Reactions at Stainless Steel Surfaces: Relevance to Localized Corrosion.....	608
<i>J. C. Vuong, R. C. Newman, M. R. Alexander, and D. Engelberg</i>	

### **Mechano-chemical Effects**

Tribocorrosion and its Prevention: Chemical, Mechanical and Materials Aspects.....	618
<i>D. Landolt and S. Mischler</i>	
Investigation into the Tribo-Corrosion Behavior of Medical Implant Alloys.....	631
<i>P. Heimgartner and R. Schenk</i>	
The Influence of Hydrogen and Tensile Stress on Pitting of Type 304 Stainless Steel.....	640
<i>Q. Yang, J.G. Yu and J.L. Luo</i>	
Pitting Corrosion of Stainless Steels under Straining Conditions: From Macroscopic to Local Analysis.....	653
<i>V. Vignal, R. Oltra, N. Mary, and B. Vuillemin</i>	
Investigation of the Stress Corrosion Cracking and Corrosion Fatigue Resistance of Nanostructured Al-Mg Alloys.....	663
<i>M. M. Sharma-Judd, B. A. Shaw, and E. Sikora</i>	
Electrochemical Kinetics at Stainless Steel and Noble Metal Surfaces in High Temperature Water.....	676
<i>Y. Kim</i>	
Corrosion Behavior of Magnetically Graded Materials Made by Martensitic Transformation.....	685
<i>K. Noda, T. Ono, H. Masuda, T. Kodama, H. Sakai, and Y. Watanabe</i>	
AUTHOR INDEX.....	692
SUBJECT INDEX.....	694