

Table of Contents

A Summary of the Passivity Symposium H.L. Hartnagel and W.J. Plieth	3
Fundamental Aspects of the Passivation of Metals and Semiconductors K.E. Heusler	9
Passivation and Control of Semiconductor Interfaces by Interface Control Layers H. Hasegawa	23
A comparison of the Oxidation and Passivation of Si, Ge and InP E.A. Irene	37
Laser Interferometry and SMX-Techniques for Thermal Characterization of Thin Films E. Oesterschulze, L. Hadjiiski, M. Stopka and R. Kassing	43
Determination of Interface State Density Distribution and Surface Recombination Velocity on Passivated Semiconductor Surfaces by Photoluminescence Surface State Spectroscopy T. Saitoh and H. Hasegawa	53
Non-Steady State C-V Methods for Determination of Interface State Parameters K.L. Temnikov and I.A. Uritskaya	59
Composition, Structure and Modification of Passivating Films on Semiconductors Deposited at Low Temperatures M.R. Baklanov and L.L. Vasilyeva	65
Passivity and electronic properties of the silicon/silicondioxide interface H. Flietner	73
Electrochemical and Electronic Passivation by Hydrogenation of n-Si(111) J. Rappich and H.J. Lewerenz	83
Influence of Tunneling on Trapping Kinetics in Thin Layers S. Scharf, M. Schmidt and D. Bräunig	91
On the Nature of the Radiation-Induced Failure of Si-SiO₂ Structures Annealed in Hydrogen S.N. Kuznetsov and V.A. Gurtov	99
Characteristics of Si-SiO₂ Systems Obtained by Thermal Oxidation of Silicon Surface Covered with Silicon-Hydrogen Layers V.Y. Uritsky and B.B. Loginov	105
Passivation and Depassivation of Electrically Active Centers in the Polysilicon-Oxide-Silicon Structures I.A. Uritskaya and V.Y. Uritsky	109
Role of Electron / Hole Processes in the Initial Stage of Silicon Anodization V.X. Uritsky	115
Effect of Structure of Hydrogenated SiN_x:H Films on the Dissociation Mechanism of Si-H and N-H Bonds E.B. Gorokhov, A.G. Noskov, V.V. Vasilyev, E.M. Trukhan, V.N. Ovsyuk and G.Y. Salieva	119
Stress Generation and Relaxation in Passivating Films and its New Application in Nanolithography E.B. Gorokhov, A.G. Noskov and V.Y. Prinz	129
High Resolution Surface Characterisation Using STM Light Emission Techniques J. Horn, N. Marx, B.L. Weiss, H.L. Hartnagel, M. Stehle, M.M. Bischoff and H. Pagnia	145
Passivation of Semiconductors by the Remote Plasma Technique W. Kulisch, F. Kiel, M. Schiller, S. Reinke and R. Kassing	155
AES Study of the GaAs-Germanium Oxynitride Interface D. Jishiasvili, R. Dzhanlidze, Z. Shiolashvili and I. Nakhutsrishvili	165
Passivation Studies of Se/GaAs Interface using X-Ray Photoelectron and Photoluminescence Spectroscopy B.A. Kuruvilla, A. Datta and R.S. Kulkarni	171
Passivation of GaAs with Sulphur Surface Treatment and UVCVD Silicon Nitride Cap Layer H. Sik, J.L. Courant and B. Sermage	179

Silicon Nitride and Oxide Deposited by Direct Photolysis on Sulfur Treated GaAs and InP: Application to III-V Passivation	
N. Proust, G. Guillot, M. Petitjean, M. Beguet, J.F. Chapeaublanc and J. Perrin	185
Surface Passivation of III-V Compound Semiconductors with Chalcogen Atoms	
H. Oigawa, H. Shigekawa and Y. Nannichi	191
Passivation of InP for Optoelectronics	
H. Kräutle	199
Formation of Oxide Films on HgCdTe after Fluorine-Consist Rinsing	
L. Romashko, A. Myasnikov, V.N. Ovsyuk, V. Vasilyev and T. Zemtsova	209
STM and AFM Studies of Passive Films	
P. Marcus and V. Maurice	221
Disorder and Structural Relaxation in Passive Films on Fe-Cr Alloys	
M.P. Ryan, S. Fujimoto, G.E. Thompson and R.C. Newman	233
Atomic Structure and Mechanical Behaviour of Passive Film Formed on Stainless Steels	
J.M. Olive, V. Vignal and D. Desjardins	241
AFM Observations of the Breakdown Damage in Anodic T₂O₅ Films	
I. Montero, J.M. Albella and L. Vázquez	251
STM Images of Material Surfaces Deformed by Impingement of a Solid Ball and Characterizations of their Passive Films	
H. Nanjo, N. Sanada and K. Koike	261
Structure of Galvanostatic Anodic TiO₂ Films: Comparison of Microscopies	
J.L. Delplancke, M.-. Delplancke and R. Winand	267
Electrochemical and Surface Analytical Characterization of Hot Water Oxide Layers on Iron-Chromium Alloys	
F. Schneider, M. Herrich, A. John, J. Engelmann and K. Mummert	275
Short-Range Order and Structure of Silicon Dioxide and Silicon Nitride Layers	
E.A. Repnikova and V.A. Gurtov	285
Structure of Aluminium Oxide Films and its Changes due to Thermal and Electrochemical Processes	
N.M. Yakovleva and A.N. Yakovlev	293
EXAFS Analysis of Passivating Films	
H.-. Strehblow and P. Borthen	301
Methods to Determine the Composition of Passive Films: Recent Trends in XPS, AES and SIMS	
D. Landolt, P. Schmutz and H.J. Mathieu	313
XPS Analysis of Passive Films Formed on Chromium in Acidic Solution without and with Chloride Ions	
D. Costa, W.P. Yang and P. Marcus	325
Ageing of Passive Films on Stainless Steels in Sulfate Solutions - XPS Analysis	
A.M. Rossi and B. Elsener	337
Dissolution and Passivation of Stainless Steels Eposed to Hydrochloric Acid	
L. Wegrelius and I. Olefjord	347
Study of Corrosion Protective Lyers on Iron Surfaces by X-Ray Photoelectron- and Moessbauer-Spectroscopic Methods	
F.H. Kármán, C. Vértes and E. Kálmán	357
Passivity of Metals and Alloys and its Breakdown - New Results from New Non-Electrochemical Techniques	
J. Kruger, L.A. Krebs, G.G. Long, J.F. Anker and C.F. Majkrzak	367
Microscopic Modification of Passive Films on Metals: Preparation of Defined Profiles and their Analysis	
J.W. Schultze	377
Electronic Structure of the Passivation Layer: New Computational Methods and Results	
N. Yu and J.W. Halley	389
Physical Concept of Single Electrode Potential	
N. Sato	397
Stress Generation during Anodic Oxidation of Tungsten	
S. Pyun, J.D. Kim and R.A. Oriani	407

Physical-Mechanical and Electrical Properties of Aluminum Anodic Films L. Dima and L. Anicai	419
Laserphotoelectrochemical Investigation of TiO₂ Passive Films H. Gräfe and W.J. Plieth	425
A Photoelectrochemical Study of Passivating Layers on Nickel C. Sunseri, S. Piazza and F. Di Quarto	435
Photoelectrochemical Analysis of the Hydroxide Surface Films on Aluminum and its Alloys T.D. Burleigh	447
In-Situ Ellipsometric Studies of the Passivation of Fe-Cr-Ni Steel in Acid Solution W. Kozłowski	457
Passivation of (Fe_{1-z}Cr_z)₈₃B₁₇ Glassy Metals Studied by Ellipso- Reflectometry D. Huerta and K.E. Heusler	465
Ellipsometric Determination of the Density of TiO₂ passive Films on Ti Single Crystals: Combination of Ellipsometry and Coulometry A. Michaelis, J.L. Delplancke and J.W. Schultze	471
Potential Modulated Ellipsometric Measurements on the Fe17Cr Alloy in Sulphuric Acid L.C. Jacobs, H.P. De Vogel, K. Hemmes, M.M. Wind and J.H. De Wit	481
Analysis of Electrochemically Coloured Aluminum Anodic Films by Diffuse Reflectance Spectra L. Anicai, A. Meghea, C. Sirean and L. Dima	489
Strong Acid- and Alkali-Resistant ZrO₂-TiO₂ Composite Oxide Thin Films Formed by Low-Pressure MOCVD S. Kikkawa, N. Hara and K.I. Sugimoto	497
Passive Rust Layer on Low-Alloy Steel Exposed in Atmospheric Environment M. Yamashita, H. Miyuki, H. Nagano and T. Misawa	505
Kelvin Probe Measurements of the Corrosion Potential of Low-Alloy Steels in Dry-Wet Cycles M. Yamashita, H. Nagano, F. Guillaume and R.A. Oriani	515
Dielectric Breakdown Processes in Anodic Films under High Electric Fields J.M. Albella, I. Montero and J.M. Martinez-Duart	527
Study of the Anodic Silicon Oxide Transformation during the Breakdown Process O. Najmi, I. Montero, L. Galán and J.M. Albella	535
Basic Laws of Electrical Breakdown of Thin Dielectric Layers V.A. Gurtov, N.Y. Ershova and P.A. Raikerus	543
A New Model of Ionic and Electronic Processes during Anodic Oxidation of Valve Metals L.L. Odynets	553
Kinetic Electronic Phenomena in Metal Oxide Dielectric Films S.D. Khanin	563
Structure Inhomogeneities of the Oxide Dielectric and the Properties of Tantalum Capacitors S.D. Khanin	573
Preparation and Properties of Ultra Thin Anodic Valve Metal Oxide Films A.W. Hassel and M.M. Lohrengel	581
Logarithmic Kinetics of the Ion Charge Accumulation in the SiO₂ Dielectric Layers V.N. Ovsyuk	591
A Surface Charge Approach to the Growth and Relaxation in Anodic Passive Films on Metals M. Bojinov	601
Transient Ionic Space Charges in Thin Oxide Films: Determination of Thickness Distribution, Temperature, and Localized Phenomena M.M. Lohrengel and S. Rüsse	611
A New eletrochemical Technique for In Situ Measurement of Electric Resistance and Semiconductor Characteristics of Surface Films on Metals T. Saario and J. Piippo	621
Investigations of the Anodic Behaviour of Iron in Sulfuric Medium by the Electrochemical Quartz Crystal Microbalance under AC Regime C. Gabrielli, M. Keddam, F. Minouflet and H. Perrot	631

The Use of Rotating Split-Ring Disc Electrodes for the Estimation of Fe(II) and Fe(III) Species in Surface Layers on Iron in Borate Buffer J. Flis and J. Wilinski	641
Effect of Bare Metal Surface on the Repair and Dissolution of Magnetite Film I.H. Plonski	649
The Study of the Kinetics of the Passivation of Nickel in High Temperature Aqueous Solutions T. Agladze, G. Tsursumia, I. Khorbaladze and T. Ekhvaia	655
Oxide Film Formation Studies on Aluminum using the Quartz Crystal Microbalance J. Gnoinski, F.K. Crundwell and S.W. Orchard	667
Investigation of Passive Film Formation by Using Impedance Spectroscopy M. Gaberšcek, S. Pejovnik, O. Fruhwirth and G. Herzog	677
The Nature of Passive Films on Thallium Anodes in Basic Solutions O.A. Petrii, G.A. Tsirlina and S.Y. Vassiliev	687
A Theoretical Interpretation of Dissolution and Passivation of Titanium in Acidic Media A.I. Scherbakov and T.E. Andreeva	693
In Situ Measurements of Oxygen Consumption and Hydrogen Evolution in Corrosion of some Metals in Liquid Water L. Gråsjö, G. Hultquist, Q. Lu and M. Seo	703
The Influence of the Subsequent Oxidation on the Passive Behaviour of Nitrided and Nitrocarburized Steels U. Ebersbach, S. Friedrich and T. Nghia	713
Dissolution, Passivation and Composition of Passive Films of Binary Iron-Nitrogen Alloy U. Kamachi Mudali, B. Reynders and M. Stratmann	723
Effect of Nitrogen on the Passivity and Passivity Breakdown of High Nitrogen Austenitic Steels B. Reynders and M. Stratmann	731
The Formation and Properties of a Thick Passive Film on Fe-Cr Alloys with Square Wave Potential Pulse Polarization S. Fujimoto and T. Shibata	741
The Influence of Copper on Passivation of Fe-Cr-Cu and Fe-Cr-Ni-Cu Stainless Steel A. Mazurkiewics, J. Glowina and J. Banas	749
Investigation of Spontaneous Passivation of Stainless Steels Modified with Ruthenium P. Baradlai, J.H. Potgieter, W.O. Barnard, L. Tomcsányi and K. Varga	759
Electrochemical Study of Passive Films on Stainless Steel AISI 304 in Carbonate Aqueous Solution at pH 8 M. Drogowska, L. Brossard and H. Ménard	769
Similarity and Difference in Roles of Chromium and Molybdenum in Passivating Amorphous Alloys in Concentrated Acids K. Hashimoto, P.Y. Park, J.H. Kim, E. Akiyama, H. Habazaki, A. Kawashima and K. Asami	779
In-Door Atmospheric Corrosion Behavior of Rapidly Quenched Amorphous Zr-Cu Alloys K. Asami, E. Akiyama, Y. Murakami, H. Kimura, M. Kikuchi and K. Hashimoto	789
Nature of Anodic Dissolution of Amorphous Ni-P Alloys A. Królikowski	799
The Corrosion Behavior of Sputter-Deposited Amorphous Al-Cr-Ti Alloys in 1 M HCl E. Akiyama, H. Habazaki, A. Kawashima, K. Asami and K. Hashimoto	809
Determination of the Stability of the Passive Layer on Al-SiC Composite Material M.A. Malik, H. Bala and E. Maahn	819
Corrosion and Stability of Lead Brass Alloy in Acid and Neutral Solutions - EIS Investigation W.A. Badawy, A.A. Mazhar, S.S. Elegamy and A.S. El-Azabe	829
Passivity of Metals in Anhydrous Solutions of Oxy-Acids J. Banas	845
Specific Features of the Metal Passivation in Organic and Water-Organic Media V.A. Safonov, E.V. Lapshina, T.H. Minh and S.Y. Volosova	853
Passivity of Lithium in Organic Solvents D. Rahner	861

Passivation of Iron and Nickel in Concentrated Solutions of Formic and Acetic Acids J. Banas, A. Mazurkiewics, W. SolarSKI and K. Banas	871
Film Formation on Iron in Methanol-Water Borate Buffer Solutions Studied with the Rotating Split-Ring Disc Electrode J. Wilinski and J. Flis	877
Passivity of Silicon-Containing Austenitic Stainless Steel in Concentrated Sulphuric Acid M.B. Ives, J.R. Kish and J.R. Rodda	887
The Effects of Electrolyte Structure on the Passivation of Chromium B. Stypula	897
A Model for the Passivation of Bismuth in Concentrated Sulphuric Acid Solutions Emphasizing the Structure and Properties of the Anodic Layer M. Bojinov, T. Tzvetkoff and A. Girginov	907
Passive Oxide Film Growth and Pitting Corrosion of Nickel in LiCl-KCl Eutectic Melt Containing Oxide Ion M. Tada and Y. Ito	917
Concerning Passivity Breakdown on Solid and Liquid Gallium and Titanium in Halide Solutions D.J. Ellerbrock and D. Macdonald	927
Laser Activation of Passive Electrodes I. Efimov, M. Itagaki, M. Keddam, R. Oltra, H. Takenouti and B. Vuillemin	937
Dissolution Kinetics of Model Pits of Stainless Steels L.I. Freiman	945
Effect of Nonmetallic Inclusions in Steels on Stability of their Passive State M. Janik-Czachor, A. Szummer and S. Hofmann	955
On the Stability of Passive Films on Stainless Steels J. Virtanen and H. Böhni	965
A Comprehensive Electrochemical Approach to the Relation between Pitting, Passivity and Inclusions in Stainless Steel J.H. De Wit, E.F.M. Jansen and L.C. Jacobs	975
Effect of Nanometer Size Cr-Depleted Fe-Rich Region on Passivity Breakdown Y. Ishikawa and T. Yoshimura	985
In Situ Ionic Imaging for Pitting Corrosion Sites on Austenitic Stainless Steels with Scanning Electrochemical Microscopy H. Tanabe, Y. Yamamura and T. Misawa	991
Film Breakdown and Pit Formation during Cathodic Polarization of Aluminum Covered with Anodic Oxide Films: Effect of Film Preparation and Structure H. Takahashi, K. Fujiwara and M. Seo	1001
Effect of Cr, W and Ta on the Pitting Potential of Sputtered Ni-Alloys Z. Szklarska-Smialowska, S. Shademan and R. Inturi	1011
Studies on Breakdown and Repair of Passivating Films on Iron and Stainless Steel Á. Rauscher, G. Kutsán and Z. Lukács	1021
Pitting Corrosion Resistance of High-Alloyed Stainless Steels V. Cíhal	1029
Pitting Susceptibility of Chromium Modified Passive Films of a B₂-FeAl Intermetallic Alloy S. Frangini, J. Lascovich and N. De Cristofaro	1041
Breakdown of Passivity of Al-Mo Glassy Metals M. Janik-Czachor, A. Wolowik and Z. Werner	1049
Relationship between Human Perception and Breakdown of Passivity I. Muto and H. Kihara	1057
Light Induced Inhibition of Local Passivity Breakdown P. Schmuki and H. Böhni	1065
Photo-Protection of 304 Stainless Steel with TiO₂ Coating R. Fujisawa and S. Tsujikawa	1075