

## Nucleation and Growth

Ion-Assisted Diamond Nucleation and Growth S.T. Lee and R.Q. Zhang	1
Ion Energy Distributions in the Bias Enhanced Nucleation of CVD Diamond Sz. Kőtai, Z. Tass, Gy. Hars, and P. Deák	12
A Kinetic and Morphological Study of Diamond Interlayer Growth David S. Dandy, Jungheum Yun, and Pushpa Mahalingam	23
An Influence of Subsidiary Activation Mode on the Diamond CVD A.E. Alexenko, L.L. Bouilov, and B.V. Spitsyn	31
Model Predictions Versus Experiments: CH <sub>3</sub> Radical Density Profiles in Diamond Deposition Microwave Plasma Reactor A. Gicquel, K. Hassouni, T. Owano, X. Duten, and M. Cappelli	41
Self-Consistent Modeling of Moderate Pressure H <sub>2</sub> Plasmas Obtained in Diamond Deposition Microwave Reactors K. Hassouni, T.A. Grotjohn and A. Gicquel	53
Atmospheric Pressure Plasma Deposition of A-C:H Films in Barrier Discharges C.-P. Klages, R. Thyen, and M. Vergöhl	64
Direct Growth of Diamond Components V. Ralchenko, L. Schirone, G. Sotgiu, A. Zakhidov, R. Baughman, A. Khomich, M. Nunuparov, I. Vlasov, V. Frolov, and A. Karabutov	72
Spatially Resolved Measurements of CH Concentration and Temperature in a Hot-Filament CVD Reactor E.H. Wahl, T.G. Owano, C.H. Kruger, U. Lommatsch, D. Aderhold, and R.N. Zare	80
Diamond Deposition From Plasma Jets With Chlorinated and Brominated Benzenes As Carbon Sources Hideo Aida, Ken-ichi Itoh, and Osamu Matsumoto	91
Effect of Surface Oxidation on the Diamond Deposition on Silicon Wafer Substrate Ken-ichi Itoh, Gen Suzuki, and Osamu Matsumoto	97
Examination of Hexagonal Platelet Diamond Growth by Atomic Force Microscopy Sally C. Eaton and Mahendra K. Sunkara	103

Effect of Cyclic Process to the Selective Deposition of Diamond Film on Glass Substrate	110
S.-H. Kim, T.-G. Kim, and Y.-H. Kim	
Nucleation of Diamond on Si Cones by Biased Hot Filament Chemical Vapor Deposition	120
W.L. Wang, K.J. Liao, S.X. Wang and J.L. Xiao	
High Rate Low Power Microwave Plasma CVD of Carbon Nitride Films Ladislav Bardos, Hana Baráková and Adéla Bardos	126
Monoprecursor Based CVD of ALN In Hot and Cold Wall Reactors A.B. Spitsyn, M.A. Prelas, V.P. Stoyan, M.D. Davydov and B.V. Spitsyn	133
Deposition of Amorphous C-N Thin Films by Pulsed Laser Deposition Under Nitrogen Radical Beam Irradiation Yoshifumi Aoi, Kojiro Ono, Kunio Sakurada and Eiji Kamijo	148
An Influence of Subsidiary Activation Mode on the Diamond CVD A.E. Alexenko, L.L. Bouilov, B.V. Spitsyn	156

## **Doping and Characterization**

Studies of Very Small Grain of CVD Diamond From an Enhanced Microwave Discharge Surface Wave Guide System Vladimir Jesus Trava-Airoldi, Adriana Faria Azevedo, Evaldo Jose Corat, Jo��o Roberto Moro and Nelia Ferreira Leite	167
Methane Effects on Grain Boundary Formation and Intrinsic Stress in CVD Diamond Brian W. Sheldon, Sumit Nijhawan and Janet Rankin	175
Electronic Structure Studies of Nanocrystalline Diamond Grain Boundaries Peter Zapol, Michael Sternberg, Thomas Frauenheim, Dieter M. Gruen and Larry A. Curtiss	185
Surface-Enhanced Raman Study of C-H and C-D Stretching Vibrations on Diamond Surface Koichi Ushizawa, Mikka N.-Gamo, Changyong Xiao, Isao Sakaguchi, Yoichiro Sato and Toshihiro Ando	191
Predicted Electronic and Cleavage Properties of Diamond O.A. Shenderova and D.W. Brenner	199
Correlation of Photo Electron Emission Microscopy and Field Emission from Nitrogen-Doped Diamond Films R.J. Nemanich, F.A.M. K��ch, S.L. English and A.T. Sowers	206
n-Type Doping of Diamond by Ion-Implanted Group VI Atoms Johan F. Prins	216
Sulfur-Doping: A New Donor Dopant for <i>N</i> -Type Diamond Mikka Nishitani-Gamo, Isao Sakaguchi, Eiji Yasu, Yoichiro Sato, Toshimitsu Suzuki and Toshihiro Ando	225
Effects of Hydrogen on Electrical Properties of N-Type Phosphorous-Doped Diamond Epitaxial Film Toshihiko Nishimori	237
Fano Line Fitting of Raman Spectra on [100] Facet of Boron-Doped CVD Diamond Koichi Ushizawa, Mikka N.-Gamo, Changyong Xiao, Kenji Watanabe, Yoichiro Sato and Toshihiro Ando	247
Electrical and Optical Properties and Applications of Diamond-like Carbon A. Grill	252

Electrical and Photoelectrical Properties of the Structures Based on Nitrogen-Doped Nanocrystalline Diamond Films V. Polyakov, A. Rukovishnikov, N. Rossukanyi, and S. Pimenov	264
Deep Level Transient Spectroscopy of the Structures Based on Diamond Films V.I. Polyakov, A.I. Rukovishnikov and N.M. Rossukanyi	269

## **Applications**

A Highly Adhesive Gold-Based Metallization System for CVD Diamond Substrates Farhat Jahangir, H.A. Naseem, W.D. Brown, A.P. Malshe and S.S. Ang	275
Functionally Graded WC/Co/Diamond Composites O.A. Voronov, G.S. Tompa, B.H. Kear, R.K. Sadangi and C.C. Wilson	290
Binderless Polycrystalline Diamonds for Geothermal Drilling O.A. Voronov, G.S. Tompa, B.H. Kear, and C.C. Wilson	300
Development of Diamond Microtip Field Emitter Device W.P. Kang, J.L. Davidson, A. Wisitsora-at, and D.V. Kerns	311
Diamond UV Photoconductors: Defect Passivation for High Speed Operation Michael D. Whitfield, Stuart P. Lansley, Olivier Gaudin, Robert D. McKeag, Nadeem Rizvi and Richard B. Jackman	322
Hydrogen Doped Thin Film Diamond Phototransistor/Photodiode Structures for the Detection of UV Radiation Michael D. Whitfield, Hui Jin Looi, Stuart P. Lansley, John S. Foord, and Richard B. Jackman	330
Development of CVD Diamond Radiation Detectors F. Foulon, D. Tromson, R.D. Marshall, L. Rousseau, B. Guizard, C. Mer, A. Brambilla and P. Bergonzo	340
Organic Light Emitting Devices With Diamond Electrodes W.L. Wang, K.J. Liao, Y.W. Sun and J.L. Xiao	349
Diamond Film as an FET Gate Dielectric Material M.C. Christopher, J.L. Davidson, L. Jiang, W.P. Kang, J.J. Sheehy and R.L. Steinbach	354
Microstructures in Diamond for "DMEMS", Diamond Micro Electromechanical Systems K.C. Holmes, A. Wisitsora-at, T.G. Henderson, J.L. Davidson, W.P. Kang, and V. Pulugurta	360
Properties and Applications of Amorphous Diamond Carbon and Metal Nitride Films B. Goetz, T. Skotheim, V. Inkin, G. Kirpilenko, V. Bozhkov and A. Dadonov	369

## **Electrochemistry of Diamond**

Recent Progress in Electrochemistry and Photoelectrochemistry on Polycrystalline Boron-Doped Diamond Surfaces A. Fujishima, Tata N. Rao and D.A. Tryk	383
A Systematic Electrochemical Study of Diamond Electrodes with Various Boron Doping Concentrations Ferhat Zenia, Ndeye Awa Ndao, Alain Deneuville and Claude Lévy-Clément	389
Structure-Reactivity Studies at Boron-Doped Single and Polycrystalline Diamond Thin-Film Electrodes: Relationship to Applications in Electroanalysis Jishou Xu, Michael C. Granger, Jian Wang, Qingyun Chen, Małgorzata A. Witek, Mateusz L. Hupert, Amy Hanks and Greg M. Swain	403
Surface Hysteresis for Copper Trapping on Boron-Doped Diamond Electrode Narumi Ohta and Seiichiro Nakabayashi	416
Nanolithographic Modification of Homoepitaxial and Polished Polycrystalline Boron-Doped Diamond Surfaces M. Yanagisawa, H. Tai, I. Yagi, D.A. Tryk and A. Fujishima	423
The Incorporation of Pt and Pt/Ru Particles in Boron-Doped Diamond Thin-Films: Applications in Electrocatalysis Jian Wang and Greg Swain	428
Electrodes of Nitrogen-Incorporated Tetrahedral Amorphous Carbon in Aqueous Media Kwangsun Yoo, Barry Miller, Rafi Kalish and Xu Shi	440
Behavior of Redox Reactions on Metal-Doped Diamondlike Carbon Films Mahendra K. Sunkara, Prabhakar Koduri, E.C. Dickey and X. Fan	448
Aluminum Deposition and Nucleation on Nitrogen-Incorporated Tetrahedral Amorphous Carbon Electrodes in Ambient Temperature Chloroaluminate Melts Jae-Joon Lee, Barry Miller, Xu Shi, Rafi Kalish and Kraig A. Wheeler	458
Wastewater Treatment with Diamond Electrodes M. Fryda, A. Dietz, D. Herrmann, A. Hampel, L. Schäfer, C.-P. Klages, A. Perret, W. Haenni, C. Comninellis and D. Gandini	473
Electrochemical Oxidation of Phenol on CVD Carbon Electrodes P.L. Hagans, P.M. Natishan, B.R. Stoner and W.E. O'Grady	484

Analysis of Organic Plating Additives Using Boron-Doped Diamond Electrodes	491
Heidi B. Martin, John J. D'Urso, Philip W. Morrison, Jr., Uziel Landau and John C. Angus	
Electrochemical Oxidation of Histamine and Serotonin at Highly Boron-Doped Diamond Electrodes	502
B.V. Sarada, Tata N. Rao, D.A. Tryk and A. Fujishima	
Electrochemical Oxidation of Sulfa Drugs at Boron-Doped Diamond Electrodes	507
Tata N. Rao, B.V. Sarada, D.A. Tryk and A. Fujishima	
Electrochemical Oxidation of Purines and Purine-Based Nucleotides Using Boron-Doped Diamond Electrodes	512
Elena Popa, Donald A. Tryk and Akira Fujishima	
Electrochemical Study with Diamond Electrode at Different Levels of Boron Dopping	518
L.L.G. Silva, N.G. Ferreira, E.J. Corat, V.J. Trava-Airoldi and K. Iha	