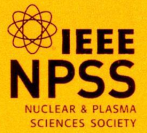


TUM
i-68/4ps

IEEE TRANSACTIONS ON PLASMA SCIENCE



A PUBLICATION OF THE IEEE NUCLEAR AND PLASMA SCIENCES SOCIETY

DECEMBER 2014

VOLUME 42

NUMBER 12

ITPSBD

(ISSN 0093-3813)

PART I OF THREE PARTS

SPECIAL ISSUE ON THE APSPT 2013

GUEST EDITORIAL

Introduction to the Special Issue on the APSPT 2013 *J.-S. Wu, C.-C. (Jerry) Hsu, J. P. Chu, and K. Teii* 3654

SPECIAL ISSUE PAPERS

Electrical and Optical Characterization of Atmospheric-Pressure Helium Plasma Jets Generated With a Pin Electrode: Effects of the Electrode Material, Ground Ring Electrode, and Nozzle Shape	<i>H. M. Joh, H. R. Kang, T. H. Chung, and S. J. Kim</i>	3656
Tailoring Surface Properties of Nonwoven Polypropylene by Cyclonic Atmospheric Pressure Plasma	<i>C.-Y. Tsai, T.-C. Wei, K.-S. Chen, R.-S. Juang, and C. Huang</i>	3668
Hydrogen Production From Hydrocarbons With Use of Plasma Discharges Under High Pressure Condition	<i>Y. Nishida, C.-Z. Cheng, and K. Iwasaki</i>	3674
Gas Flow Dependence on Dynamic Behavior of Serpentine Plasma in Gliding Arc Discharge System	<i>F. Mitsugi, T. Ohshima, H. Kawasaki, T. Kawasaki, S.-I. Aouki, T. Baba, and S. Kinouchi</i>	3681
Effect of Multiple Frequency H ₂ /Ar Plasma Treatment on the Optical, Electrical, and Structural Properties of AZO Films	<i>M. Wu, T. Huang, C. Jin, L. Zhuge, Q. Han, and X. Wu</i>	3687
Spectroscopic Characteristics of Supersonically Expanding Nitrogen Arc-Jet Plume—Strong Atomic Lines and Weak Molecular Band Spectra	<i>H. Akatsuka, M. Hatcho, and H. Matsuura</i>	3691
Surface Characterization of Argon/Methane Mixture Atmospheric-Pressure Plasma-Treated Filtration Poly(Vinylidene Fluoride) Membrane and Its Flux Enhancement	<i>R.-S. Juang, K.-S. Chen, T.-C. Wei, C.-H. Liu, C.-Y. Tsai, H.-Y. Jheng, and C. Huang</i>	3698
Gate Leakage Characteristics for 28 nm HfZrO _x pMOSFETs After DPN Process Treatment With Different Nitrogen Concentration	<i>W.-D. Lee, M.-C. Wang, S.-J. Wang, C.-W. Lian, and L. S. Huang</i>	3703
Properties of Soil Treated With Ozone Generated by Surface Discharge	<i>F. Mitsugi, T. Nagatomo, K. Takigawa, T. Sakai, T. Ikegami, K. Nagahama, K. Ebihara, T. Sung, and S. Teii</i>	3706

(Contents Continued on Page 3653)

000248

107 122014
HELFERICH SCIENTIFIC INFO GMBH
URO RAN
HOLSTEINISCHE STR 44
10717 BERLIN
GERMANY



Gate Leakage for 28 nm Stacked HfZrO _x Dielectric of p-Channel MOSFETs After Decoupled Plasma Nitridation Treatment With Annealing Temperatures	3712
..... S.-J. Wang, M.-C. Wang, W.-D. Lee, J.-M. Yang, L. S. Huang, and H.-S. Huang	
Plasma-Aided Coal Ignition and Combustion: Modeling and Full-Scale Trials	3716
..... V. E. Messerle and A. B. Ustimenko	
Threshold Voltage Reduction and Mobility Improvement of LTPS-TFTs With NH ₃ Plasma Treatment	3722
..... W. C.-Y. Ma, S.-W. Yuan, T.-C. Chan, and C.-Y. Huang	
Novel Atmospheric Pressure Plasma Utilizing Symmetric Dielectric Barrier Discharge for Mass Spectrometry Applications	3726
..... C.-Y. Chen, C.-H. Chiang, and C.-H. Lin	
Numerical Study on Acceleration and Deceleration Mechanism of Weakly Ionized Plasma Flowing Supersonically Through Open Field Line	3732
..... S. Tsuno, T. Nakahagi, R. Yamashiro, A. Nezu, H. Matsuura, and H. Akatsuka	
Effects of Gate Dielectric and Process Treatments on the Electrical Characteristics of IGZO TFTs With Film Profile Engineering	3742
..... B.-S. Shie, H.-C. Lin, R.-J. Lyu, and T.-Y. Huang	
Modification of Early Effect for 28-nm nMOSFETs Deposited With HfZrO _x Dielectric After DPN Process Accompanying Nitrogen Concentrations	3747
..... W.-D. Lee, M.-C. Wang, S.-J. Wang, W.-H. Lan, C.-W. Li, and B.-W. Yang	
Fine Al ₂ O ₃ Powder Produced by Radio-Frequency Plasma From Aluminum Dross	3751
..... S.-F. Yang, T.-M. Wang, Z.-Y. J. Shie, S.-J. Jiang, C.-S. Hwang, and C.-C. Tzeng	
A Flexible Paper-Based Microdischarge Array Device: A Novel Route to Cost-Effective and Simple Setup Microplasma Generation Devices	3756
..... Y.-J. Yang and C.-C. Hsu	
Plasma Medical Science for Cancer Therapy: Toward Cancer Therapy Using Nonthermal Atmospheric Pressure Plasma	3760
..... H. Tanaka, M. Mizuno, K. Ishikawa, K. Takeda, K. Nakamura, F. Utsumi, H. Kajiyama, H. Kano, Y. Okazaki, S. Toyokuni, S. Maruyama, F. Kikkawa, and M. Hori	
Efficient Production of Hydrogen by DBD Type Plasma Discharges	3765
..... Y. Nishida, H.-C. Chiang, T.-C. Chen, and C.-Z. Cheng	
Lithium Electrochemical and Electrochromic Properties of Atmospheric Pressure Plasma Jet-Synthesized Tungsten/Molybdenum Mixed Oxide Films for Flexible Electrochromic Devices	3772
..... Y.-S. Lin, T.-H. Tsai, and W.-H. Lu	
Effect of Plasma Radical Composition in Intrinsic a-Si:H on Performances of Heterojunction Solar Cells	3786
..... Y.-S. Cho, C.-H. Hsu, S.-Y. Lien, D.-S. Wu, P. Han, C.-F. Chen, and J.-H. Wang	
The GaN-Based Light Emitting Diode Grown on Nanopattern Sapphire Substrate Prepared by Inductively Coupled Plasma Etching	3792
..... J.-H. Lin, S.-J. Huang, Y.-K. Su, and K.-W. Huang	
Nonequilibrium Modeling of Steam Plasma in a Nontransferred Direct-Current Torch	3797
..... S.-W. Chau, C.-M. Tai, and S.-H. Chen	
Dry Reforming of CH ₄ With CO ₂ to Generate Syngas by Combined Plasma Catalysis	3809
..... K. L. Pan, W. C. Chung, and M. B. Chang	
Simulation of Low-Pressure Capacitively Coupled Plasmas Combining a Parallelized Particle-in-Cell Simulation and Direct Simulation of Monte Carlo	3819
..... J. S. Kim, M. Y. Hur, I. C. Song, H.-J. Lee, and H. J. Lee	
Reverse Electrical Behavior of N-Channel and P-Channel LTPS-TFTs by N ₂ O Plasma Surface Treatment	3825
..... W. C.-Y. Ma, C.-Y. Huang, T.-C. Chan, and S.-W. Yuan	
Atomic Oxygen and Hydroxyl Radical Generation in Round Helium-Based Atmospheric-Pressure Plasma Jets by Various Electrode Arrangements and Its Application in Sterilizing <i>Streptococcus mutans</i>	3830
..... C.-T. Liu, C.-J. Wu, Y.-W. Yang, Z.-H. Lin, J.-S. Wu, S.-C. Hsiao, and C.-P. Lin	
Hydrophilic Stability of Plastic Surfaces Treated in Low- and Atmospheric-Pressure Radio-Frequency Plasmas	3837
..... R.-C. Hsiao, T.-L. Sung, C.-M. Liu, S. Teii, T.-C. Chan, S. Ono, K. Teii, C.-C. Yang, and S.-C. Zeng	
Direct Measurement of Metal Surface Temperature During Catalytic Dissociation of Ozone for Sensor Application	3842
..... T.-L. Sung, R.-C. Hsiao, C.-M. Liu, S. Teii, H.-P. Jhou, K. Teii, S. Ono, K. Ebihara, and F. Mitsugi	
Effects of Oxygen Plasma and Dopamine Coating on Poly(Vinylidene Fluoride) Microfiltration Membrane for the Resistance to Protein Fouling	3847
..... I. Yared, S.-L. Wang, and M.-J. Wang	
Hydrophilic DLC Surface Induced by Nanostructures Formed by RF O ₂ Plasma Etching With Metal Micromasks	3858
..... T. Harigai, K. Iwasa, H. Furuta, and A. Hatta	
Plasma Deposition of Diamond at Low Pressures: A Review	3862
..... K. Teii	