

IEEE TRANSACTIONS on DIELECTRICS and Electrical Insulation

August 2016

Volume 23

Number 4

ITDEIS

(ISSN 1070-9878)

DIELECTRIC LETTERS

- Lab on Dielectric Film Deposited PCB Device for Characterization of Electrical Property of Biological Cells.....*C. Ren, S. Zhang, D. Song and J. Guo* 1895–1897

CONDITION MONITORING

- Time Growing Frequency Sweep Signal based Insulation Condition Monitoring in Frequency Domain Spectroscopy*A. K. Pradhan, B. Chatterjee, D. Dey and S. Chakravorti* 1898–1906

ELECTRICAL MACHINES

- Design of High Thermal Conductivity Insulation Adhesive (H-Class) for Low Voltage Motor*C. Liu, X. Zheng, M. Yin and X. Cheng* 1907–1914

ELECTRICAL TREES

- Effect of Low Temperature on Electrical Treeing of Polypropylene with Repetitive Pulse Voltage.....*B. X. Du, L. W. Zhu and T. Han* 1915–1923

- Dielectric Liquids for Enhanced Field Force in Macro Scale Direct Drive Electrostatic Actuators and Rotating Machinery.....*B. Ge and D. C. Ludois* 1924–1934

FIELD MEASUREMENTS

- Electric Field Distribution in Oil-Pressboard Insulation under AC-DC Combined Voltages.....*B. Qi, X. Zhao, C. Li and H. Wu* 1935–1941

- Transient Electric Field Computation for Composite Cross-arm in 750 kV AC Transmission Line Under Lightning Impulse Voltage.....*X. Yang, Q. Wang, H. Wang, S. Zhang and Z. Peng* 1942–1950

GASEOUS DIELECTRICS

- Theoretical and Experimental Studies of Air Gap Breakdown Triggered by Free Spherical Conducting Particles in DC Uniform Field.....*J. Wang, Q. Li, B. Li, C. Chen, S. Liu and C. Li* 1951–1958

- Breakdown of CF₃I Gas and Its Mixtures under Lightning Impulse in Coaxial-GIL Geometry.....*L. Chen, H. Griffiths, A. Haddad and M. S. Kamarudin* 1959–1967

- Effect of Branching on Spikes of Positive Leader Current.....*X. Zhao, J. He and H. He* 1968–1973

- Influence of Forest Fire Particles on the Breakdown Characteristics of Air Gap*P. Li, D. Huang, J. Ruan, H. Wei, Z. Qin, M. Long, Z. Pu and T. Wu* 1974–1984

- Electrode Erosion and Lifetime Performance of a Triggered Corona-stabilized Switch in SF₆ at a Repetition Rate of 1 kHz.....*J. M. Koutsoubis, K. Thoma and S. J. MacGregor* 1985–1995

- Assessment of Electron Swarm Parameters and Limiting Electric Fields in SF₆ + CF₄ + Ar Gas Mixtures.....*S. S. Tezcan, H. Duzkaya, M. S. Dincer and H. R. Hiziroglu* 1996–2005

- NO_x Reduction from Biodiesel Exhaust by Plasma Induced Ozone Injection Supported by Lignite Waste Adsorption.....*A. G. Sarah and B. S. Rajanikanth* 2006–2014

LIQUID DIELECTRICS

- A Novel Bench Size Model Coalescer: Dehydration Efficiency of AC Fields on Water-in-Crude-Oil Emulsions.....*C. Lesaint, G. Berg, L. Lundgaard and M.-H. G. Ese* 2015–2020

- Jatropha Curcas Methyl Ester Oil Obtaining as Vegetable Insulating Oil*H. B. H. Sitorus, R. Setiabudy, S. Bismo and A. Beroual* 2021–2028

- The Effect of DBDS, DBPC, BTA and DBP Combinations on the Corrosion of Copper Immersed in Mineral Transformer Oil.....*A. M. Y. Jaber, N. A. Mehanna, G. A. Oweinreen and A. M. Abulkibash* 2029–2035

- Detection of High-Energy Ionizing Radiation Generated by Electrical Discharges in Oil.....*L. Nagi, D. Zmarzly, T. Boczar and P. Frqcz* 2036–2041

- Analysis of Frequency Domain Dielectric Response of Pressboard Insulation Impregnated with Different Insulating Liquids.....*K. Bandara, C. Ekanayake and T. Saha* 2042–2050

- Development of Palm-based Neopentyl Glycol Diester as Dielectric Fluid and Its Thermal Aging Performance*N. A. Raof, U. Rashid, R. Yunus, N. Azis and Z. Yaakub* 2051–2058

- Charge Coupling Behavior of Double-layer Oil–Paper Insulation under DC and Pulse Voltages.....*B. X. Du and J. G. Zhang* 2059–2067

- Effect of Antioxidants on Critical Properties of Natural Esters for Liquid Insulations*S. S. Kumar, M. W. Iruthayarajan, M. Bakruthien and S. G. Kannan* 2068–2078

- Breakdown Characteristics of Oil-impregnated Paper and Influential Factors for Damped Alternating Oscillation Waveforms.....*W. Sima, J. Wu, P. Sun, M. Yang and J. Hua* 2079–2087

MEASUREMENT TECHNIQUES

- A Boost Converter-based Ringing Circuit with High-Voltage Gain for Unipolar Pulse Generation.....*A. Elserougi, S. Ahmed and A. Massoud* 2088–2094

NANODIELECTRICS

- Dielectric Properties of Silanized-Silicon/Epoxy Nanocomposites*W. Sun and N. Bowler* 2095–2101

- Characteristic Analysis of Surface Damage and Bulk Micro-Cracks of SiR/SiO₂ Nanocomposites Caused by Surface Arc Discharges.....*Y. Liu, D. Zhang, H. Xu, S. M. Ale-Emran and B. X. Du* 2102–2109

- Effect of TiO₂ Nanoparticles on Streamer Propagation in Transformer Oil under Lightning Impulse Voltage.....*Y. Lv, Y. Ge, C. Li, Q. Wang, Y. Zhou, B. Qi, K. Yi, X. Chen and J. Yuan* 2110–2115

- Effects of Thermal Conductivity on Dielectric Breakdown of Micro, Nano Sized BN Filled Polypropylene Composites.....*B. X. Du and B. Cui* 2116–2125

OUTDOOR INSULATION

- Research of Nondestructive Methods to Test Defects Hidden within Composite Insulators Based on THz Time-Domain Spectroscopy Technology.....*L. Cheng, L. Wang, H. Mei, Z. Guan and F. Zhang* 2126–2133

- Influence of AC Electric Field on Conductor Icing*F. Yin, M. Farzaneh and X. Jiang* 2134–2144

- Characteristics of Streamer Propagation along the Insulation Surface: Influence of Shed Configuration.....*X. Meng, H. Mei, L. Wang, Z. Guan and J. Zhou* 2145–2155

- A Method for Unambiguous Identification of On-Field Recorded Insulator Leakage Current Waveforms Portraying Electrical Activity on the Surface.....*R. Ghosh, B. Chatterjee and S. Chakravorti* 2156–2164

- An OH-PDMS-Modified Nano-Silica/Carbon Hybrid Coating for Anti-Icing of Insulators Part II: Anti-Icing Performance*X. Yan, J. Li, L. Li, Z. Huang, J. Hu and M. Lu* 2165–2173

- Principle and Simulation of a High Voltage Bushing for a Repetitive Electron Accelerator.....*J. Egorov* 2174–2180

- An Investigation into the Effect of Shattered Glass Discs on Insulation Strength under HVDC Voltage Stress*N. Mahatho, N. Parus, T. Govender and G. Sibilant* 2181–2188

- Source Strength Impact Analysis on Polymer Insulator Flashover under Contaminated Conditions and a Comparison with Porcelain.....*L. He and R. S. Gorur* 2189–2195

- Simulation Study on Pollution Accumulation Characteristics of XP13-160 Porcelain Suspension Disc Insulators.....*Y. Lv, J. Li, X. Zhang, G. Pang and Q. Liu* 2196–2206

- PARTIAL DISCHARGES**

- Impact of Velocity on Partial Discharge Characteristics of Moving Metal Particles in Transformer Oil Using UHF Technique.....*J. Tang, S. Ma, X. Li, Y. Zhang, C. Pan and J. Su* 2207–2212

(continued on inside)

IEEE TRANSACTIONS on DIELECTRICS and Electrical Insulation

August 2016

Volume 23

Number 4

ITDEIS

(ISSN 1070-9878)

PAPERS (CONTINUED)

| | | |
|--|---|-----------|
| Study on Micro Bridge Impurities in Oil-Paper Insulation at DC Voltage: Their Generation, Growth and Interaction with Partial Discharge | <i>Y. Li, Q. Zhang, J. Li, T. Wang, W. Dong and H. Ni</i> | 2213–2222 |
| Partial Discharge Detection in 11.4 kV Cast Resin Power Transformer | <i>M.-K. Chen, J.-M. Chen and C.-Y. Cheng</i> | 2223–2231 |
| Degradation of Conformal Coatings on Printed Circuit Boards due to Partial Discharge | <i>C. Emersic, R. Lowndes, I. Cotton, S. Rowland and R. Freer</i> | 2232–2240 |
| The Effect of Surface Charge Decay on the Variation of Partial Discharge Location | <i>C. Pan, K. Wu, Y. Du, Y. Meng, Y. Cheng and J. Tang</i> | 2241–2249 |
| Partial Discharge Occurrence Induced by Crack Defect on GIS Insulator Operated at 1100kV | <i>H.-X. Ji, C.-R. Li, G.-M. Ma, Z.-K. Pang, Z.-G. Tang, H. Wen and B.-Y. Cui</i> | 2250–2257 |
| SOLID DIELECTRICS | | |
| Influence of Addition of Hydroxyl-terminated Liquid Nitrile Rubber on Dielectric Properties and Relaxation Behavior of Epoxy Resin | <i>C. Wang, H. Li, H. Zhang, H. Wang, L. Liu, Z. Xu, P. Liu and Z. Peng</i> | 2258–2269 |
| Comparison of Gamma-ray Resistance between Dicyclopentadiene Resin and Epoxy Resin | <i>M. Miyamoto, N. Tomite and Y. Ohki</i> | 2270–2277 |
| Improved Resistance of Epoxy Resin to Corona Discharge by Direct Fluorination | <i>Z. An, H. Xiao, F. Liu, F. Zheng, Q. Lei and Y. Zhang</i> | 2278–2287 |
| Hydrophobic Surface Modification of Epoxy Resin Using an Atmospheric Pressure Plasma Jet Array | <i>Z. Fang, Z. Ding, T. Shao and C. Zhang</i> | 2288–2293 |
| Dehydration Reaction Effect of Metal Hydroxide on AC Voltage Lifetime of Epoxy Composites | <i>T. Ohta and K. Iida</i> | 2294–2302 |
| Statistical Analysis of Dielectric Breakdown of Liquid Insulated Printed Circuit Boards | <i>A. A. Abdelmalik, M. D. Borge, A. Nysveen, L. E. Lundgaard and D. Linhjell</i> | 2303–2310 |
| Life Estimation Using Damage Equalization Method and Step-stress Breakdown Tests | <i>A. P. S. Tiwana and C. C. Reddy</i> | 2311–2318 |
| A Unified Expression for Enlargement Law on Electric Breakdown Strength of Polymers under Short Pulses: Mechanism and Review | <i>J. Su, L. Zhao, J. Cheng, Y. Pan, R. Li and B. Zeng</i> | 2319–2327 |
| Characteristics of Microsecond-pulse Surface Flashover on Epoxy Resin Surfaces in SF ₆ | <i>Q. Xie, Y. Wang, X. Liu, H. Huang, C. Zhang and T. Shao</i> | 2328–2336 |
| SPACE AND SURFACE CHARGES | | |
| Improvement of Space Charge Suppression of Polypropylene for Potential Application in HVDC Cables | <i>J.-W. Zha, Y.-H. Wu, S.-J. Wang, D.-H. Wu, H.-D. Yan and Z.-M. Dang</i> | 2337–2343 |
| Measurement of Space Charge in Negative Corona on a Small Corona Cage | <i>R. J. Liao, K. L. Liu, H. B. Liu and F. F. Wu</i> | 2344–2352 |
| Effects of Direct Fluorination on Space Charge Accumulation in HTV Silicone Rubber | <i>B. X. Du, Z. L. Li and J. Li</i> | 2353–2360 |
| Modelling Space Charge in a Cable Geometry | <i>S. Le Roy, G. Teyssèdre and C. Laurent</i> | 2361–2367 |
| Effects of AC and Pulse Voltage Combination on Surface Charge Accumulation and Decay of Epoxy Resin | <i>B. X. Du, A. Li and J. Li</i> | 2368–2376 |
| Measurement of Surface Potential of Non-uniformly Charged Insulating Materials Using a Non-contact Electrostatic Voltmeter | <i>A. Fatihou, L. Dascalescu, N. Zouzou, M.-B. Neagoe, A. Reguig and L. M. Dumitran</i> | 2377–2384 |
| Characteristics of Space Charge Distribution in Epoxy-Paper Composite Insulation System | <i>P. Liu, H. Feng, H. Zhang, X. Ning, D. Li and Z. Peng</i> | 2385–2392 |
| Dynamic Charge Transport Characteristics in Polyimide Surface and Surface Layer under Low-energy Electron Radiation | <i>G. Li, S. Li, S. Pan and D. Min</i> | 2393–2403 |
| Space Charge Characteristics of Power Cables under AC Stress and Temperature Gradients | <i>D. He, W. Wang, J. Lu, G. Teyssèdre and C. Laurent</i> | 2404–2412 |
| TRANSFORMERS | | |
| Effects of High Thermal Conductivity on Temperature Rise of Epoxy Cast Windings for Power Transformer | <i>M. Xiao and B. X. Du</i> | 2413–2420 |
| Investigations on Copper Sulfide Diffusion into Paper Insulation of Transformers | <i>J. S. Rajan, S. D. Flora and C. Ranganathaiah</i> | 2421–2429 |
| Accumulative Effect of Repeated Lightning Impulses on Transformer Insulation: Mechanism Analysis | <i>P. Sun, W. Sima, M. Yang, J. Wu and J. Hua</i> | 2430–2437 |
| Maximum Acceptable Concentrations of DBDS, Sulphur Mercaptan and Optimal Concentration of Passivators for Safe and Prolonged Operation of Power Transformers | <i>S. Rehman, L. M. Alhems, R. Jadim, B. A. Al Faraj, K. S. Balasubramanian, K. S. Al Mutairi, A. K. Al-Yemni, D. V. Shinde and S. A. Al-Hsaini</i> | 2438–2442 |
| An Air Core Pulse Transformer with a Linearly Integrated Primary Capacitor Bank to Achieve Ultrafast Charging | <i>R. A. Petrella, S. Xiao and S. Katsuki</i> | 2443–2449 |
| Prebreakdown and Breakdown Mechanisms of an Inhibited Gas to Liquid Hydrocarbon Transformer Oil under Positive Lightning Impulse Voltage | <i>W. Lu and Q. Liu</i> | 2450–2461 |
| Compensating the Effect of Temperature Variation on Dielectric Response of Oil-paper Insulation Used in Power Transformer | <i>A. Baral and S. Chakravorti</i> | 2462–2474 |
| Performance Analysis of Alternate Liquid Dielectrics for Power Transformers | <i>U. M. Rao, Y. R. Sood and R. K. Jarial</i> | 2475–2484 |
| VACUUM INSULATION | | |
| Studies on Mechanism of Arc Propagation in Vacuum involving Multiple Power Circuits | <i>R. P. Jayakumar, N. G. Pai and R. V. Lakshmi</i> | 2485–2491 |
| BODIELECTRICS | | |
| Experimental Study on Breakdown Behavior and Vacuole Isolation of Protoplasts under Electrical Pulses | <i>T. Tonapan, N. Panklang, B. Techamunrat and A. Tuantranont</i> | 2492–2498 |
| ERRATUM | | |
| Space Charge and Electric Field in Thermally Aged Multilayer Joints Model | <i>C. Stancu, P. V. Notingher, P. Notingher and M. Lunguiescu</i> | 2499 |