SYMPOSIUM ED9

Advanced Interconnects for Logic and Memory Applications—
Materials, Processes and Integration
April 18 - April 19, 2017

Symposium Organizers
Mikhail Baklanov, North China University of Technology (NCUT)
Jeffery Bielefeld, Intel Corporation
Vincent Jousseaume, CEA-LETI
Eiichi Kondoh, University of Yamanashi

Symposium Support
Air Liquide
Applied Materials
CEA-LETI

Proceedings Statement
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* Invited Paper

SESSION ED9.1: Low-K Materials I
Session Chairs: Mikhail Baklanov and Jeffery Bielefeld
Tuesday Morning, April 18, 2017
PCC North, 100 Level, Room 128 B

10:30 AM *ED9.1.01
Boron-Based Solids for Advanced Interconnect Applications Michelle M. Paquette; University of Missouri–Kansas City, United States.

11:00 AM *ED9.1.02
Material Innovations for Future BEOL Interconnects E. T. Ryan; GLOBALFOUNDRIES, United States.

11:30 AM ED9.1.03
Metal-Organic Frameworks as Gap Filling Low-K Dielectric Material in Advanced Interconnects Mikhail Krishtab[1, 2]; [1]imec, Belgium; [2]KU Leuven, Belgium.

11:45 AM ED9.1.04
Silica Aerogel Low-K Films towards Inter Layer Dielectric (ILD) Ashok M. Mahajan; North Maharashtra University, India.

SESSION ED9.2: Memory Applications
Session Chairs: Vincent Jousseaume
John Zhang
Tuesday Afternoon, April 18, 2017
PCC North, 100 Level, Room 128 B

1:30 PM *ED9.2.01
The N3XT 1,000× of Computing Energy Efficiency H.-S. Philip Wong; Stanford University, United States.

2:00 PM ED9.2.02
Mechanism for Bipolar Resistive Switching in Annealed GO Thin Films Pooja Saini; University of Delhi, India.

2:15 PM ED9.2.03
Reduction of Interface Trap in Poly-Si Channel for 3D NAND Device through Dielectric Recovery Process Dong Uk Lee; SKhynix Inc., Korea (the Republic of).

2:30 PM BREAK

SESSION ED9.3: Advanced Integration
Session Chairs: Eiichi Kondoh and Chen Wu
Tuesday Afternoon, April 18, 2017
PCC North, 100 Level, Room 128 B

3:00 PM *ED9.3.01
Selective Surface Modification for ALD and SAM Deposition Yves J. Chabal; University of Texas at Dallas, United States.

3:30 PM *ED9.3.02
New Material and Integration Innovations to Enable Advanced Interconnect Scaling Larry Zhao; Lam Research, United States.

4:00 PM ED9.3.03
Low Damage ULK Etching by Means of High Boiling Point Organic Condensation Romain Chanson; imec, Belgium.

4:15 PM ED9.3.04
Integration of Ultralow-K Dielectrics Using a Template Replacement Approach Liping Zhang[1, 2]; [1]imec, Belgium; [2]KU Leuven, Belgium.

4:30 PM ED9.3.05
Periodic Mesoporous Organosilica Films for Low-K Application—Promises and Challenges Murad A. Redzheb[1, 2]; [1]Gent University, Belgium; [2]imec, Belgium.

4:45 PM ED9.3.06
Thermal Stability of Low-K Dielectrics for 3D Sequential Integration Sylvain Beaurepaire[1, 2, 3]; [1]Université Grenoble Alpes, France; [2]CEA LETI MINATEC Campus, France; [3]LTM UGA/CNRS/CEA, France.

SESSION ED9.4: Poster Session
Tuesday Afternoon, April 18, 2017
8:00 PM - 10:00 PM
Sheraton, Third Level, Phoenix Ballroom

ED9.4.01
Atomic Layer Deposition of Boron Carbide for Interconnect Applications Lauren M. Dorsett; University of Missouri–Kansas City, United States.

ED9.4.02
Plasma Enhanced Chemical Vapor Deposition of Al_2O_3 Films Using Dimethylaluminum Isopropoxide without Additional Oxygen Sources Wonjin Ban; Sungkyunkwan University, Korea (the Republic of).

ED9.4.03
Electrical Properties of Low-K SiCOH Films Deposited with the Phenyltrimethoxysilane Single Precursor Sungyool Kwon; Sungkyunkwan University, Korea (the Republic of).

ED9.4.04
Evaluation of New Spin-On Deposited Ultra Low-K Films Developed for Gap Filling Application Yingjie Wang; North China University of Technology, China.

ED9.4.05
Effect of Carbon Bridge Content on Spin-On Copolymer PMO Films K. Vorotilov; Moscow Technological University, Russian Federation.

SESSION ED9.5: Integration and Metallization
Session Chairs: Jeffery Bielefeld and Larry Zhao
Wednesday Morning, April 19, 2017
PCC North, 100 Level, Room 128 B

8:00 AM *ED9.5.01
CMP Challenges for Advanced Technology Nodes John H. Zhang; GLOBALFOUNDRIES, United States.

8:30 AM ED9.5.02
Controlling the Microstructure of Electroless Cobalt for Semiconductor Interconnect Applications Kevin Musick[1, 2]; [1]SUNY Polytechnic Institute, United States; [2]University at Albany, State University of New York, United States.

8:45 AM ED9.5.03
Insight into the Molecular Structure of Amino-Copper (II) Formates in Forming High Conductivity Copper Films for Printable Electronics Chantal Paquet; National Research Council of Canada, Canada.

9:00 AM ED9.5.04
Etching of Transition Metals (Co, Ni, Fe, Pt) Using Supercritical Fluids Eiichi Kondoh; University of Yamanashi, Japan.

9:15 AM ED9.5.05
Pore Surface Grafting of Porous Low-K Dielectrics by Selective Polymers Askar Rezvanov[1, 2, 3]; [1]imec, Belgium; [2]Moscow Institute of Physics and Technology, Russian Federation; [3]Molecular Electronics Research Institute, Russian Federation.

9:30 AM BREAK

SESSION ED9.6: Novel Processing Methods
Session Chairs: Yves Chabal and Eiichi Kondoh
Wednesday Morning, April 19, 2017
PCC North, 100 Level, Room 128 B

10:00 AM *ED9.6.01
3D Sequential Integration—Opportunities and Challenges in Low Temperature Process Modules Claire Fenouillet-Beranger; CEA/LETI, France.

10:30 AM ED9.6.02
Self-Aligned Growth of 3D Nano-Bridge-Based Interconnects by Gas Phase Electrodeposition Leslie Schlag; TU Ilmenau FG Nanotechnologie, Germany.

10:45 AM ED9.6.03
The Effects of Organic Acids on Electrodeposited Cu Films in Sub-Micron Trenches Tyler Pounds; Johns Hopkins University, United States.

11:00 AM ED9.6.04
The Impact of Solute Segregation on Grain Boundaries in Dilute Cu Alloys Takanori Tsurumaru[1, 2]; [1]State University of New York Polytechnic Institute, United States; [2]SUMCO Corporation, Japan.

11:15 AM ED9.6.05
Growth and Characterization of Ultrathin Conformal Nickel Films by Plasma-Enhanced Atomic Layer Deposition Pouyan Motamedi[1, 2]; [1]National Institute for Nanotechnology, Canada; [2]University of Alberta, Canada.

11:30 AM ED9.6.06
A Comprehensive Comparison of Scanning Laser Annealing and Microwave Annealing for Ion Implanted Si Joe Hillman; Universal Laser Systems, United States.

11:45 AM ED9.6.07
Interface-Controlled Carrier Transport in Metal-Lutetium Oxide-Metal Structures Deposited by Electron-Beam Evaporation Technique Khalid Mahmood; Government College University Faisalabad, Pakistan.

SESSION ED9.7: Low-K Materials II
Session Chairs: Vincent Jousseaume and E. Ryan
Wednesday Afternoon, April 19, 2017
PCC North, 100 Level, Room 128 B

1:30 PM *ED9.7.01
Establishing the Relationship between Low-K Dielectric Properties and Intrinsic Conduction and Degradation Mechanisms Chen Wu; imec, Belgium.

2:00 PM ED9.7.02
Significant Reduction in Plasma Induced Damaged in Porous Low-K Material Using Spin-On Pore Protection Coatings Lin Zhang; SBA Materials Inc., United States.

2:15 PM ED9.7.03
Experimental Study of Plasma-Induced Damage in Cryogenic Etching of Porous Low-K Dielectrics in CF_3Br and CF_4 Askar Rezvanov[1, 2]; [1]Moscow Institute of Physics and Technology, Russian Federation; [2]Molecular Electronics Research Institute, Russian Federation.