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Tuesday, October 14th

Session A
Fillers - A
Co-Chairs: **Wesley Wampler; Timothy A. Okel**

1 8:30 a.m. Interactions Between Silica and Epoxidized Natural Rubber with and without Silane – **Anke Blume**, Univerity of Twente, The Netherlands pg. 1

2 9:00 a.m. Mixing Silica in Natural Rubber: The Impact of Surface Treatment and Mixing Parameters on Performance Properties, Throughput and Energy Usage – **Justin Martin**, PPG Industries, Inc. pg. 23

9:30 a.m. Break

3 9:45 a.m. Influence of Silica Characteristics on Tire Performance Indicators – **Wilma K. Dierkes**, University of Twente, The Netherlands pg. 44

4 10:15 a.m. Silica Morphology: Beyond the Surface to Benefit Non-Tread Tire Components to Further Reduce Energy Loss – **Timothy A. Okel**, PPG Industries, Inc. pg. 103

Session B
Rubber Aging and Durability - AM
Chair: **Richard Pazur**

5 8:30 a.m. Review of Some Important Issues and Resolutions When Lifetime Predictions of Elastomers Are Made Using Accelerated Aging Techniques – **Kenneth Gillen**, Sandia National Laboratories pg. 125

6 9:30 a.m. Shelf Age Stiffening in High Diene Elastomers – **James R. Halladay**, Lord Corporation pg. 158

10:00 a.m. Break

7 10:15 a.m. The Impact of Age Stiffening on Fatigue Crack Growth in Natural Rubber and Polybutadiene – **Casey Hedlund**, LORD Corporation pg. 178

Session C
Nanocomposites and Regulations on Nanofillers
Chair: **Robert H. Schuster**

8 8:30 a.m. Solubility and Diffusivity of CO2 in Elastomers Containing CNT – **Xuming Chen**, Cameron pg. 197

9 9:00 a.m. Effect of the Incorporated POSS Nanoparticles in Fluoroelastomer – **Heloisa Augusto Zen**, IPEN-CNEN/SP, Brazil pg. 228

9:30 a.m. Break

10 9:45 a.m. In Situ Generation of Nanosilica in a Plasticizer – **Kothandaraman Balasubramanian**, Anna University, India pg. 245

11 10:15 a.m. Nanofillers, Potentials, Limitations and Risks – **Robert H. Schuster**, Deutsches Institut fur Kautschuktechnologie pg. 257

Session A
Fillers - B
Co-Chairs: **Timothy A. Okel; Wesley Wampler**

12 1:30 p.m. The Effect of Silane Loading on the Tear Strength and Abrasion Resistance of a Silica Filled SBR Model Tread Compound – **Jonathan Martens**, Akron Rubber Development Laboratory pg. 277

13 2:00 p.m. Evaluation of Various Carbon Blacks in Highly Extended EPDM Compounds for Extrusion Applications – **Erick Sharp**, Portage Precision Polymers pg. 300

14 2:30 p.m. Improvements in Carcass Carbon Blacks to Enhance Compound Performance – **Michael Jacobsson**, Sid Richardson Carbon & Energy pg. 316

3:00 p.m. Break

15 3:15 p.m. Performance of Guayule and Hevea Natural Rubber Composites Made with Waste-Derived Fillers – **Cindy Barrera**, Ohio Agricultural Research and Development Center, Food, Agricultural and Biological Engineering, The Ohio State University pg. 357

16 3:45 p.m. Innovative Bio-Sourced Compatibilizers for Carbon and White Fillers in Rubber Compounds – **Maurizio Galimberti**, Politecnico di Milano, Italy pg. 368

17 4:15 p.m. Rice Husk Ash Silica: Agricultural Byproduct to Silica Filler – **Michael Beaulieu**, Bridgestone Americas Center for Research and Technology pg. 410

Session B
Rubber Aging & Durability - PM
Chair: **Richard Pazur**

20 1:30 p.m. The Effect of Plasticizer Extraction By Jet Fuel on a Nitrile Hose Compound – **Richard Pazur**, Department of National Defense, Canada pg. 420

21 2:00 p.m. Low Volatility Plasticizers for AEM Compounds – **Edward McBride**, DuPont Performance Polymers pg. 459

22 2:30 p.m. Low Temperature Capable Fluoroelastomer Compatibility in Jet Fuel – **Richard Pazur**, Department of National Defense, Canada pg. 478

Session C
Mechanics and Modeling of Rubber
Co-Chairs: **Peter Mott; Anoop G. Varghese**

24 1:30 p.m. Sealing Force Measurement: Characterizing Materials and Configuration Responses – **Paul Tuckner**, Grace Technology and Development pg. 513

25 2:00 p.m. Failure of Classical Elasticity in Auxetic Foams – **Peter Mott**, U.S. Naval Research Laboratory pg. 546

26 2:30 p.m. Prediction of Rubber Abrasion – **Guangchang Wu**, Queen Mary University of London, United Kingdom pg. 565

27 3:00 p.m. Rubber Characterization for Tire Modeling – **Nihar Raje**, Bridgestone Americas Tire Operations pg. 578

3:30 p.m. Break

28 3:45 p.m. Stress Softening of Filled Rubbers and Its Internal Morphologies – **Yoshihiro Morishita**, Bridgestone Co., Japan pg. 602

29 4:15 p.m. An Amplitude, Temperature and Prestrain Dependent Constitutive Model of Dynamic Modulus for Tire Rubbers – **Mengxi Huang**, Institute of Engineering Mechanics, Nanchang University pg. 618

30 4:45 p.m. Prediction of Mechanical Property of Compounds by Using a Genetic Algorithm and Artificial Neural Network – **Teck Cheng Seng**, Rubber Research Institute of Malaysia, Malaysia pg. 634

Wednesday, October 15th

Session A
Fillers-C
Co-Chairs: **Timothy A. Okel; Wesley Wampler**

31 8:30 a.m. Mechanisms of Particulate Reinforcement of Elastomers at Small Strains – **Lewis Tunnicliffe**, Queen Mary University of London, United Kingdom pg. 647

32 9:00 a.m. Study of Polymer-Filler Interactions – **Ed Cole**, 3M pg. 657

33 9:30 a.m. Carbon Black Particle Size: What Does It "Mean"? – **Tyler Gruber**, Birla Carbon pg. 698

10:00 a.m. Break

34 10:15 a.m. Advances in Filler Dispersion Measurement – **Leszek Nikiel**, Sid Richardson Carbon & Energy Co. pg. 732

35 10:45 a.m. Graphene's Impact on the Properties of Synthetic and Natural Rubber Formulations Using Commercial Processing Techniques – **Raymond Sauro**, Vorbeck Materials

CANCELLED

Session B
Advances in Materials and Tire Technology - AM
Co-Chairs: **Christopher Robertson; Syed K. Mowdood; J. Cal Moreland**

36 8:30 a.m. Worldwide Tire Surveys – **Walter H. Waddell**, ExxonMobil Chemical Co. pg. 752

38 9:00 a.m. A Coupled Thermo-Mechanical Analysis for Steady State Tire Temperature and Rolling Resistance Based on Fluid-Structure Interaction – **Mengxi Huang**, Institute of Engineering Mechanics, Nanchang University, China pg. 767

39 9:30 a.m. Flocculation in Elastomeric Polymers Containing Nanoparticles: Jamming and the New Concept of Fictive Dynamic Strain – **Christopher Robertson**, Eastman Chemical Company CANCELLED

10:00 a.m. Break

40 10:15 a.m. Investigation of the Rubber-Brass Adhesion Layer Using the Olefin-Metathesis Method – **Simon Leimgruber**, Polymer Competence Center Leoben GmbH, Austria pg. 785

41 10:45 a.m. Technologies for Polymeric Cord/Rubber Adhesion in Tire Applications – **Andre Louis**, University of Twente, The Netherlands pg. 813

59 11:15 a.m. Modified Soybean Oil-Extended SBR Compounds and Vulcanizates – **Avraam I. Isayev**, The University of Akron, Department of Polymer Engineering pg. 1229

Session A
New Commercial Developments
Co-Chairs: **R. Christopher Napier; Peter Cameron**

Paper #42-51 NOT AVAILABLE FOR SALE, except for:

43 1:50 p.m. Fluorinated Nitrile Elastomers for Drilling Applications – **Ming Yu Huang**, GE Oil & Gas pg. 842

Session B
Advances in Materials and Tire Technology - PM
Co-Chairs: **Christopher Robertson; Syed K. Mowdood; J. Cal Moreland**

52 1:00 p.m. On the Silanization Kinetics and Compound Properties in Silica Filled Rubbers – **C. Jeffrey Lin**, Momentive Performance Materials Inc. pg. 858

53 1:30 p.m. Investigations of Highly Dispersible Silica Types and Silane Types in a "Green" OTR Cut Resistant Tire Tread Application – **Louis Gatti**, Evonik Corp. CANCELLED

54 2:00 p.m. Incorporating and Optimizing Performance of Micronized Rubber Powder and Functionalized Micronized Rubber Powder in SSBR/Silica- Silane Tire Treads – **Frank Papp**, Lehigh Technologies, Inc. pg. 883

55 2:30 p.m. Study of Compatibility and Miscibility for Polymers and Copolymers Based on Butadiene and Isoprene – **Adel Halasa**, The University of Akron College of Polymer Science pg. 915

3:00 p.m. Break

56 3:15 p.m. Investigation of Composition and Processing Parameters on Mechanical Properties of Magadiite/SBR Composites – **Yating Mao**, University of South Carolina pg. 921

57 3:45 p.m. Properties and Structure of SBR/BR Blends and Compounds Ultrasonically Treated in Single Screw Extruder – **Tian Liang**, The University of Akron pg. 954

58 4:15 p.m. Study of Processing Via Gamma Rays and Further Shear for Bromobutyl Rubber Recycling – **Sandra Regina Scagliusi**, Instituto de Pesquisas Energéticas e Nucleares – IPEN, Brazil pg. 988

Session C
11th Annual Student Colloquium – 8:00 a.m. - 5:00 p.m.
Wednesday, October 15, 2014

8:00 a.m. **Keynote Speaker, Dr. R. Ray Gehani – The University of Akron, College of Business Administration -** *Transforming Scientists, Engineers, and Researchers into Innovators for Growth in Highly Competitive Global Markets*

C-1 8:55 a.m. Influence of Kevlar FF on Truck-Bus Radial Belt Skim Compound with Replacement of Resorcinol and HMMM Resin – **Narendra Khandekar**, IIT Kharagpur, India

CANCELLED

C-2 9:25 a.m. Study of the Micro-Foaming on Properties of PS/CNTs and EPDM Alternating Multilayer System – **Rui Jian**, Department of Plastics Engineering, University of Massachusetts Lowell pg. 1004

C-3 9:55 a.m. Study of Compatibilization Between PS/CNTs and EPDM Using Multilayer Co-Extrusion Process – **Minne Xie**, University of Massachusetts Lowell pg. 1021

10:25 a.m. **Morning Break**

C-5 10:35 a.m. Investigation of Rheological and Mechanical Properties of Polyether Blockamide/ Thermoplastic Polyurethane Blends Prepared Using Twin Screw Extrusion – **Smita Birkar**, University of Massachusetts Lowell pg. 1037

C-6 11:05 a.m. Enhancement of Polymer Filler Interaction in the PCR Tread Compound Based on New Generation Solution Polymerized Elastomers with Silica and Nanosilica Through Irradiation Technique – **Jatin J. Darve**, Indian Institute of Technology, Kharagpur, India

CANCELLED

C-7 11:35 a.m. Evolution of the Hysteresis Area during Fatigue Tests of a Synthetic Rubber – **Christophe Cruanes**, Laboratoire de Mécanique et Rhéologie, Université François Rabelais de Tours, France pg. 1060

12:15 p.m. - **Student Luncheon (Room 209/210)**

C-9 1:35 p.m. Properties of Silica Filled SBR Processed Through an Ultrasonic Twin Screw Extruder – **Edward Norton**, Alpha Technologies pg. 1084

C-10 2:05 p.m. Novel Nanostructured Polyamide 6/ Fluoroelastomer Thermoplastic Elastomeric Blends: Structure, Physical Properties and Dynamic Vulcanization – **Shib Shankar Banerjee**, Indian Institute of Technology, Patna, India

CANCELLED

C-11 2:35 p.m. Structure Property Relationship of Novel in-Situ Prepared Thermoplastic Polyurethane/ Hydroxyapatite Nanocomposites with Improved Antithrombotic Property for Biomedical Applications – **Selva Kumar**, Indian Institute of Technology Kharagpur, India pg. 1111

3:05 p.m. – **Afternoon Break**

C-14 3:20 p.m. Synthesis and Characterization of Poly (alloocimene-b-isobutylene) Thermoplastic Elastomers – **Attila Gergely**, The University of Akron pg. 1132

C-15 3:50 p.m. Development, Characterization, and Properties of Novel Quaternary Rubber Nanocomposites – **Kumar Sankaran**, Indian Institute of Technology, India pg. 1155

C-16 4:20 p.m. Effect of Sample Geometry and Dimensions on the Fracture of Natural Rubber Vulcanizates – **Ming-Hang Yang**, Department of Polymer Science, The University of Akron pg. 1193

Student Poster Session 10:00 a.m. – 5:00 p.m. (*Located on Expo Floor)*

P-1 Optimization of Ultrasonic Devulcanization of Cryo-Ground Tire Rubber – **Ivan Mangili**, University of Milano-Bicocca, Italy pg. 1210

P-2 Biorubbers Via Enzyme Catalyzed Reactions – **Kasra Karimian**, The University of Akron pg. 1216

P-3 Comparison of Modified Soybean Oil and Petroleum Oil in SBR Compounds and Vulcanizates – **Jiaxi Li**, The University of Akron pg. 1229

P-4 Effect of Ultrasonic Treatment on Properties and Structure of SBR/BR Blends and Filled Compounds – **Tian Liang**, The University of Akron N/A

P-5 Predicting the Diameter of Electrospun Elastomer Fibers Made from Multi-Component Solutions – **Jozsef Kantor**, The University of Akron pg. 1266

P-6 Drug Eluting Electrospun Rubbery Fiber Mats – **Aditya Jindal**, The University of Akron pg. 1275

P-7 Evaluation on Non-Carbon Black Based Electrically Conductive Agents for Polyurethane Elastomers – **Vishal Chaurasia**, The University of Akron N/A

P-8 Investigating the Dynamic Properties Using a Moving Die Rubber Process Analyzer – **Nischay Kodihalli-Shivaprakash**, University of Massachusetts Lowell N/A

P-9 Effect of Non-Rubber Constituents on Guayule and Heavea Rubber Intrinsic Properties – **Shirin Mohammad Ali Monadjemi**, Ohio State University N/A

Thursday, October 16th

Session A
Elastomers…Focus on Innovation - AM

Chair: **Jim McGraw**

60 8:00 a.m. Recent Advances in EPDM and Dynamically Vulcanized Thermoplastic Elastomers – **P.S. Ravishankar** & **Maria D. Ellul**, ExxonMobil Chemical Co. pg. 1283

61 8:30 a.m. Innovative Coatings from Low Molecular Weight EPDM – **Zhiyong Zhu**, Lion Copolymer Geismar, LLC pg. 1298

62 9:00 a.m. EPDM with High Strength, Resilience, and Fatigue Resistance of NR Also Demonstrates Superior Heat Aging Properties – **Pete Spanos**, Lanxess pg. 1310

9:30 a.m. Break

63 9:45 a.m. Improving the Crack Growth Resistance in EPDM Compounds with X_Butyl Ionomer – **Jon Bielby**, LANXESS pg. 1330

64 10:15 a.m. Propylene-Based Elastomers Extended with Polyalphaolefins – **N. Dharmarajan**, ExxonMobil Chemical pg. 1354

65 10:45 a.m. Novel Blends of Nitrile Butadiene Rubber and in-Situ Synthesized Thermoplastic Polyurethane-Urea: Preparation Method, Characterization and Properties – **Muhammad Tahir**, Leibniz-Institut für Polymerforschung Dresden e.V., Germany pg. 1376

Session B
Basic and Applied Natural Rubber Research - AM
Co-Chairs: **Andrew V. Chapman; Katrina Cornish**

66 8:00 a.m. Natural Rubber from Alternative Sources: The Key Role of Low Molecular Mass Components – **Maurizio Galimberti,** Politecnico di Milano, Italy pg. 1386

67 8:30 a.m. A Study of Protein and Amino Acids in Guayule Natural Rubber – **Colleen M. McMahan**, U.S. Department of Agriculture pg. 1420

68 9:00 a.m. A New Process for Isolation and Stabilization of Guayule Rubber from Latex – **Howard Colvin**, Cooper Tire & Rubber Co. pg. 1433

9:30 a.m. Break

69 9:45 a.m. Using Research and Development to Advance Taraxacum Kok-Saghyz (Buckeye Gold) As a Viable Source of Ohio Natural Rubber – **Katrina Cornish**, Ohio State University pg. 1450

70 10:15 a.m. Effect of Gel Content on Quality of Deproteinized Natural Rubber – **Rosamma Alex Alex**, Rubber Research Institute of India, India

CANCELLED

Session C
Cure Systems and Networks
Co-Chairs: **Leonard H. Palys; Frederick Ignatz-Hoover**

71 8:00 a.m. Activate Modern Sulfur Cure Systems in Sponge Applications Using Rhenogran Geniplex-70 (Zinc Dicyanato Diamine) – **Steven Monthey**, Rhein Chemie Corporation pg. 1460

74 8:30 a.m. Block Co-Polymer-like Phase Behavior in Ionic Elastomer – **Debdipta Basu**, Leibniz Institute of Polymer Research Dresden, Germany pg. 1478

75 9:00 a.m. Advances in Contact Dynamic Mechanical Analysis of Rubber Compounds – Applications, Methodologies, and Sample Preparation – **Bryan Crawford**, Nanomechanics, Inc. pg. 1490

Session A
Elastomers...Focus on Innovation-PM
Chair: **Jim McGraw**

76 1:00 p.m. Multi-Functionalized SSBR & Compound Vulcanizate Performance Characteristics – **Sven Thiele**, Styron Deutschland GmbH, Germany pg. 1498

77 1:30 p.m. Functionalized Elastomers for Tire Tread Applications – **Jean-Marc Marechal**, Michelin R&D, France pg. 1514

78 2:00 p.m. Novel Characterization of Block Styrene in Poly(styrene-co-butadiene) – **Hyeonjae Kim**, Bridgestone Americas Center for Research and Technology pg. 1527

2:30 p.m. Break

79 2:45 p.m. Emulsil Silica Masterbatch – a New Route to High Performance Smartway Truck Retread Compounds – **Christopher Hardiman**, INSA, LLC pg. 1541

80 3:15 p.m. Emulsil® Silica Masterbatch Technology: Compound Design Considerations for Tire Tread Applications – **John Kounavis**, INSA, LLC pg. 1562

Session B
Basic and Applied Natural Rubber Research - PM
Co-Chairs: **Andrew V. Chapman; Katrina Cornish**

82 1:00 p.m. Adhesive Rubber Friction – **David Stratford Devalba**, Queen Mary University of London, United Kingdom pg. 1580

83 1:30 p.m. Flocculation Kinetics and Filler-Rubber Interaction in Silica-Reinforced NR Compounds – **Jacques W.M. Noordermeer**, University of Twente, The Netherlands pg. 1584

84 2:00 p.m. Silica-Reinforced Epoxidized Natural Rubber Tire Treads – Performance and Durability– **Pamela Martin**, Tun Abdul Razak Research Centre, United Kingdom pg. 1604

2:30 p.m. Break

85 2:45 p.m. Tearing of Black-Filled Natural Rubber and Synthetic Polyisoprene Rubber Vulcanizates – **Sky Tianxiang Xue**, Alpha Technologies pg. 1640

86 3:15 p.m. Nanomechanical Mapping of NR/BR Blends Using Atomic Force Microscopy – **Andrew V. Chapman**, Tun Abdul Razak Research Centre, United Kingdom pg. 1676

87 3:45 p.m. Dynamic Properties of Silica-Filled Polyisoprene Rubbers and Their Blends with Polybutadiene Rubber – **Marina S. D. Fernando**, Tun Abdul Razak Research Centre, United Kingdom pg. 1690

Session C
Contributed
Chair: **John S. Dick**

88 1:00 p.m. Effects of Very Low Strain Measurements with the Extended Dynamic Range (EDR) of the RPA on the Accuracy of Shear Thinning Measurements for Rubber Compounds – **John S. Dick**, Alpha Technologies U.S. pg. 1717

89 1:30 p.m. Examining the Cold Temperature Properties of Elastomeric Systems in the Linear and Non-Linear Viscoelastic Ranges – **Deidre Tucker**, SKF Sealing Solutions pg. 1778

91 2:00 p.m. Evolution of RPA Test Methodologies for the Rubber Industry – **John S. Dick**, Alpha Technologies U.S. pg. 1786

2:30 p.m. Break

92 2:45 p.m. Enhancing Rubber-to-Substrate Bonding Performance with Chemlok® Adhesive Systems – **Mason Myers**, LORD Corporation (note: actual speaker is Jeffrey Means) pg. 1818

93 3:15 p.m. Gamma-Irradiation Effect on Mechanical Properties of PP/EPDM Polymeric Blends – **Elizabeth Carvalho Leite Cardoso**, Instituto de Pesquisas Energéticas e Nucleares – IPEN, Brazil pg. 1841