

12. Kautschuk - Herbst - Kolloquium
22. - 24. November 2016

12th Fall - Rubber - Colloquium
November 22 - 24, 2016



Deutsches Institut für Kautschuktechnologie e.V.

Scientific Program



12th Fall - Rubber - Colloquium

November 22 - 24, 2016



Tuesday, November 22, 2016

Opening ceremony

11:00

U. Giese

11:10

D. Behrens

Ministry for Economics, Labour and Transports

11:40

M.-J. Wang

EVE Rubber Institute

Filled rubber versus gum

12:15

M. Galimberti

Politecnico di Milano

*Carbon allotropes as reinforcing fillers: anisotropy, synergy,
reinforcement predictivity, chemical reactivity*

12:45

LUNCH



Tuesday, November 22, 2016

Session 1

Elastomer Chemistry

Chairperson: A. Blume

13:45 | K. Krause
Deutsches Institut für Kautschuktechnologie e.V.
Influence of Coagent/Peroxide Systems on the Crosslinking of Special-Purpose Types of Rubber with optimized Physical Properties

14:20 | B. Janowski
Synthos S.A.
Study on functionalization of solution-SBR by oligo-siloxanes having alkoxyethyl side groups

14:55 | C. Döring
Trinseo Deutschland GmbH
Functionalized Synthetic Rubber - A Key Path for Low Rolling Resistance Tires

Session 2

Elastomer Physics

Chairperson: T. Alshuth

A. Maslak
Deutsches Institut für Kautschuktechnologie e.V.
High Frequency Investigation of Filled and Unfilled Elastomers using Ultrasonic Spectrometer

R. Hickmann
TU Dresden, Institute of Textile Machinery and High Performance Material Technology
Adhesion Enhancement of PPS-Polymer composites

I. A. Morozov
Institute of Continuous Media Mechanics UB RAS
Structural-mechanical AFM study of cracks and defects on surface of natural rubber vulcanizates

Session 3

Rheology

Chairperson: E. Haberstroh

M. Wilhelm
Karlsruhe Institute of Technology
Fourier-Transform Rheology of Unvulcanized, Carbon Black Filled SBR

F. S. Grasso
Versalis S.p.A., Elastomer Research Center
Revisiting capillary rheometry characterization of raw rubber in short dies

M. Ludwig
Deutsches Institut für Kautschuktechnologie e. V.
Lifetime Prediction of Elastomers based on Quantitative Analysis of Filler Particle Size Distribution

15:25

COFFEE BREAK



Tuesday, November 22, 2016

Session 1

Elastomer Chemistry

Chairperson: A. Blume

- 15:55** **S. David**
ARLANXEO Deutschland GmbH
Creating a model for novel polymer developments based on solubility parameters
- 16:30** **J. López Valentín**
Institute of Polymer Science and Technology (ICTP-CSIC)
Ionic Elastomers with Shape-Memory properties: Influence of counter-ions on the switching thermal transition.
- 17:05** **M. Gruendken**
Kuraray Europe GmbH
Liquid Rubber as EPDM Modifier in Peroxide Curing Systems

Session 2

Elastomer Physics

Chairperson: T. Alshuth

- S. Seichter**
TU Wien, Institute for Materials Science and Technology
A study on the fatigue behaviour of industrial rubbers and rubber composites with pure-shear specimen
- D. M. Paulkowski**
Fraunhofer-Institut für Fertigungstechnik und Angewandte Materialforschung IFAM
Rapid wear testing on coated elastomers using model test rig
- M. Salehi**
University of Twente,
Department of Elastomer Technology and Engineering
Prediction of tire dry grip by using the Laboratory Abrasion Tester (LAT) 100

Session 3

Rheology

Chairperson: E. Haberstroh

- G. Nijman**
Harburg-Freudenberger Maschinenbau GmbH
A rheologically optimized extrusion line for tyre components
- M. Heinz**
Evonik Resource Efficiency GmbH
Characterization of summer tire tread compounds by Large Amplitude Oscillating Shear (LAOS)
- T. Gebauer**
SIGMA Engineering GmbH
High-pressure capillary rheometer, Accuracy of established measuring techniques

Following the lectures

POSTER SESSION



Wednesday, November 23, 2016

Session 1

Simulation & Modelling

Chairperson: J. Ihlemann

09:00 **J. Gogolin**
ContiTech AG, CT Engineering,
Advanced Simulations
Cure kinetics model for NR and SR compounds

09:35 **H. Baaser**
University of Applied Sciences Bingen
Training of Artificial Neural Networks in Compound Development - A new Study on Determination of Accuracy

10:05

10:35 **P. Westervoß**
TU Dortmund, Institute of Applied Mathematics (LS III)
Evaluation of nonlinear differential models for the simulation of polymer melts

11:10 **B. Hernández Gascón**
ITAINNOVA - Aragon Institute of Technology
Finite element simulation of the rubber mechanical behaviour due to thermal ageing at high temperatures

11:45 **S. Gelke**
TU Chemnitz, Faculty of Mechanical Engineering,
Professorship of Solid Mechanics
Simulation of rubber components with regard to strain induced softening and dynamic stiffening

12:15

Session 2

Nanocomposites

Chairperson: S. Kawahara

W. Wu
Beijing University of Chemical Technology, State Key Laboratory of Organic-Inorganic Composites
Design and preparation of high performance elastomer composites used as seismic-protection isolators

Y. Zhou
University of Technology, Nagaoka, Department of Materials Science and Technology, Faculty of Engineering
Preparation and properties of natural rubber with silica nanomatrix structure

M. M. Jacobi
Universidade Federal do Rio Grande Do Sul, Instituto de Quimica
Properties of High Performance Rubbers Reinforced by carbon based nanofillers

T. Takagi
University of Technology, Nagaoka, Department of Materials Science and Technology, Faculty of Engineering
Wet-masterbatch procedure for the preparation of natural rubber with organotinorganic nanomatrix structure

I. Hudec
Slovak University of Technology
Elastomeric magnetic composites with shielding properties

COFFEE BREAK

LUNCH

Session 3

Rubber Friction & Physics

Chairperson: M. Klüppel

J. Jungk
Freudenberg New Technologies SE & Co. KG
Looking deep into polymer structures - Potential applications for Dielectric Relaxation Spectroscopy in rubber evaluation

A. Serghei
Université Claude Bernard Lyon, Ingénierie des Matériaux Polymères
Coupled mechanical-electrical investigations on elastomeric composite materials

C. Wrana
Rex Articoli Tecnici S. A.
Crystallization of elastomers - A novel method for the characterization of the crystallization kinetics

D. Willenborg
TU Bergakademie Freiberg - Institute for Machine Elements, Design and Manufacturing
Wave propagation and damping in natural rubber - steel-interfaces of suspensions

J. Plagge
Deutsches Institut für Kautschuktechnologie e.V.
Quantification of strain induced crystallization by thermo-mechanical analysis

Session 1

Elastomer Chemistry

Chairperson: I. Hudec

- 13:15** **M. van Duin**
ARLANXEO Holding B. V.
Rationalising EPDM rubber compound data via master curves: not only practical but also enhanced understanding
- 13:50** **K. Sae-heng**
University of Technology, Nagaoka, Department of Materials Science and Technology
Latex-state NMR spectroscopy for quantitative analysis of epoxidized deprotonized natural rubber
- 14:25** **A. Kömmling**
Bundesanstalt für Materialforschung und -prüfung (BAM)
Ageing and lifetime prediction of O-ring seals made of HNBR, EPDM and FKM
- 15:00** **T. Förster**
Wehrwissenschaftliches Institut für Werk- und Betriebsstoffe (WIWeB)
High Resolution Concentration Profiles of Aged Elastomers
- 15:30**
- 16:00** **B. Nelson**
Zeon Europe GmbH
High Performance HNBR (HP-Zetpol®): New Opportunities for Sealing Applications – Improvements in Compression Set, Long Term Aging and Processability
- 16:35** **Y. Iwase**
Chemicals Evaluation and Research Institute
Ozone degradation of vulcanized isoprene rubber as a function of humidity
- 17:10** **N. Meissner**
Synthos S.A
The properties of model tire tread compounds based on functionalized SSBR containing oligosiloxy groups

Session 2

Reinforcement & Fillers

Chairperson: M. Jacobi

- J. W. Noordermeer**
University of Twente, Elastomer Technology and Engineering
Constant-strain vs. constant-stress based time-temperature superposition of viscoelastic mastercurves for silica-reinforced tyre tread compounds
- L. Guy**
Solvay Silica
High Surface Area Silica with Natural Rubber based compounds : Impact of the silane reactivity and the crosslinking density on the compromise in term of energy dissipation and wear mechanism
- J. Meyer**
University of Wuppertal
Molecular simulation approach to the prediction of mechanical properties of silica reinforced rubbers
- J. Muller**
Nanocyl S.A.
Release assessment from matrix containing-MWCNT along the lifecycle
- F. Grunert**
Evonik Resource Efficiency GmbH
Prediction of in-rubber dispersibility of silica by analytical methods
- N. Vleugels**
University of Twente, Elastomer Techn. and Engi.-
Understanding the behavior of the coupling agents TESPT and Si 363 in short-cut aramid fiber reinforced elastomers

Session 3

Nanocomposites

Chairperson: M. Galimberti

- J. G. Meier**
ITAINNOVA – Aragon Institute of Technology
On the action of synthetic layered silicates additives as filler network modifier in tire tread mixtures
- A. Kampf**
J. Rettenmaier & Söhne GmbH + Co. KG
ARBOCEL® for rubber applications – cellulose fiber with special functionality
- C. W. Karl**
Fakultät für Bauingenieurwesen und Geodäsie, Leibniz-Universität Hannover
Structure-property relationships of SBR composites
- A. Pazat**
Laboratoire de Recherches et de Contrôle du Caoutchouc et des Plastiques (LRCCP)
Chemical Modification of Graphite Oxide Sheets and Their Uses in Elastomer Nanocomposites

- S. Kawahara**
Nagaoka University of Technology
Effect of minor constituents on the mechanical properties of natural Rubber

- W. Wu**
Beijing University of Chemical Technology
Study on Structure and Property of Aramid Pulp Filled CR Composites

- M. C. V. Omelan**
Deutsches Institut für Kautschuktechnologie e. V.
Development of PDMS/CNT composites for neuro-medical application



Thursday, November 24, 2016

Session 1

Elastomer Chemistry

Chairperson: **M. van Duin**

Session 2

Elastomer Physics

Chairperson: **J. Meier**

Session 3

Network Characterisation / Cross-linking

Chairperson: **H. Geisler**

09:00 **X. Minghan**
Deutsches Institut für Kautschuktechnologie e. V.
Influence of water on dynamic mechanical properties of silica loaded tire tread vulcanizates

K. Narynbek Ulu
Research Institute GeM
Fatigue life of unaged HNBR blends tested at high temperature

A. Das
Tampere University of Technology
Development of Reversible Network of Commercial Rubbers

09:35 **Y. Aoyagi**
Freudenberg New Technologies SE & Co. KG
Study on aging process of rubber material for sealing applications

T. Kroth
Fraunhofer Institute for Structural Durability and System Reliability LBF
A concept for temperature-dependent fatigue prediction of elastomer components

B. Basterra Beroiz
Goodyear Innovation Center Luxembourg
New insights into rubber network structure by a combination of experimental techniques

10:05 **COFFEE BREAK**

Sustainability

Chairperson: **U. Giese**

10:35 **M. Jaunich**
Bundesanstalt für Materialforschung und -prüfung (BAM)
Low temperature properties of elastomer seals - Comparison between purely static and partially released seals -

C. Lenges
DuPont Industrial BioScience
Engineered Polysaccharides as Renewable Reinforcing Filler in Rubber Composites

V. Boerger
Schill+Seilacher "Struktol" GmbH
New Processing Additives For The Compounding Of Special Elastomers

11:10 **C. Gögelein**
ARLANXEO Deutschland GmbH
Morphology and mechanical properties of reinforced and crosslinked EPDM rubber blends

J. Vuorinen
Tampere University of Technology, Department of Materials Science
Vegetable additives for dielectric elastomers

N. Rennar
University of Applied Sciences, Plastics and Rubber Technology
Unusual Polymer Networks and their Rubber Elastic Properties, Theory - Experiment - Applications

11:45 **E. Jourdain**
ExxonMobil Chemical Europe Inc.
High Molecular Weight Vistalon™ EPDM grades for broad selection of applications

R. Diaz
University of Nantes, REP International
The role of processing parameters in an industrial thermo-mechanical devulcanization process

I. Chodak
Polymer Institute of the Slovak Academy of Sciences
The effect of mechanical deformation on the structure of carbon black physical network determined by electrical conductivity of the vulcanized rubber mixture

12:15 **LUNCH**

7 | Scientific Program

Thursday, November 24, 2016

Session 1

Reinforcement & Characterization

Chairperson: J. W. M. Noordermeer

- 13:15** J. López Valentín
Institute of Polymer Science and Technology (ICTP-CSIC)
Advanced Characterization of Filler-Rubber Interactions by Using Time-Domain NMR
- 13:50** M. Wunde
Deutsches Institut für Kautschuktechnologie e.V.
Tearing energy in filler reinforced elastomers for tire treads
- 14:25** A. Blume
Evonik Industries AG -
Inorganic Materials-Rubber Technology)
Infrared Study of the Silica / Silane Reaction - influence of Different Probe Molecules
- 15:00** H. Westenberg
Orion Engineered Carbons GmbH
Advanced characterization of filler dispersion by using a confocal light microscope for improved wear resistance

Session 2

Processing

Chairperson: B. Klie

- A. Schröder**
Rhein Chemie Rheinau GmbH
Industrial Implementation of the Integrated Continuous Mixing iCOM® Using the Inline Process Control Rhenowave®
- F. Lemke**
RWTH Aachen University,
Institute of Plastics Processing (IKV)
Analysis of the efficiency of continuous vulcanisation
- S. Schäfer**
RWTH Aachen University,
Institute of Plastics Processing (IKV)
Development of an extrusion die for the continuous pre-cross-linking of solid silicone rubber
- S. Teich**
Deutsches Institut für Kautschuktechnologie e. V.
The logarithmic torque as a function of the reciprocal melt temperature – Evaluating rubber mixing quality for internal mixer processes on different aggregate sizes

Session 3

Simulation & Modelling

Chairperson: N. Kröger

- J. Ihlemann**
TU Chemnitz, Faculty of Mechanical Engineering
Identification of inelastic material parameters using component-oriented specimen
- N. Heinrich**
TU Chemnitz, Faculty of Mechanical Engineering
Volumetric finite Element Models for textile reinforced Rubber components
- M. Itskov**
RWTH Aachen University,
Department of Continuum Mechanics
Mechanics of rubber composites based on polymer chain length statistics
- Khiem Ngoc Vu**
RWTH Aachen University,
Department of Continuum Mechanics
Physically-based constitutive modeling of rubber-like materials

15:30

CLOSING REMARKS

We thank all sponsors for their support

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See you again in Hannover in 2018



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