

**13. Kautschuk-Herbst-Kolloquium
6. - 8. November 2018**

**13th Fall Rubber Colloquium
November 6 - 8, 2018**



**Deutsches Institut für Kautschuktechnologie e. V.
Hannover, Germany**

Preliminary Scientific Program



13th Fall Rubber Colloquium
November 6 - 8, 2018



Tuesday, November 6, 2018

Opening ceremony

10:30

U. Giese

10:40

S. Johannsen

Lower Saxony Ministry of Science and Culture

11:10

T. Nishi

Tokyo Institute of Technology

International ultimate behavior investigation of various elastomeric seismic-protection isolators for buildings

11:40

R.H. Schuster

Dual Filler Networks - a potential route to better Performance

12:10

I. Hudec

Slovak University of Technology

Sulfur and peroxide curing of rubber compounds based on NR and NBR

12:40

LUNCH



Tuesday, November 6, 2018

Session 1
Materials

Chairperson: **M. Galimberti.**

- 13:45** **D.-M. Bielinski**
Politechnika Lodzka
Ceramizable rubber composites. Possibilities and challenges
- 14:20** **A. Das**
Tampere University Of Technology
Water-responsive Rubber Composites
- 14:55** **P. Posadas**
Institute of Polymer Science and Technology
Advanced characterization of novel Ionic elastomers by a combination of different experimental techniques

Session 2
Environment - Sustainability

Chairperson: **H. Geisler**

- E. Peuvrel-Disdier**
MINES-ParisTech, PSL Research University, CEMEF
Analysis of an industrial thermo-mechanical devulcanization process
- A. Neige**
LRCCP
BIOPROOF project: Recovered carbon blacks as new raw material for rubber applications
- I. Weilert**
Deutsches Institut für Kautschuktechnologie e.V.
Polysaccharides - An interesting category of reinforcing fillers

Session 3
Simulation

Chairperson: **N. Kröger**

- C. Zimmermann**
Institut für Kunststoffverarbeitung
Modeling of the temperature-dependent visco-elasto-plastic material behaviour of thermoplastic elastomers
- A. Ricker**
Deutsches Institut für Kautschuktechnologie e.V.
Hyperelastic Modelling and Experimental Characterisation of Cellular Rubber
- M. Ludwig**
Toyoda Gosei Meteor GmbH
Practical Difficulties Modelling Elastomeric Foams (and Solutions)

15:25

COFFEE BREAK



Tuesday, November 6, 2018

Session 1
Reinforcement

Chairperson: **H. Geisler**

- 15:55** **J. Noordermeer**
University of Twente
Silica Reinforced Natural Rubber: Synergistic Effects by Addition of Small Amounts of Secondary Fillers to Silica-Reinforced Natural Rubber Tire Tread Compounds
- 16:30** **M. Staropoli**
Luxembourg Institute for Science and Technology
Structural evolution of silica filler clusters in SBR under quasi-static deformation
- 17:05** **W. Kaewsakul**
University of Twente
Influence of silane modifiers with different functionalities on silica-filled NR compounds

Session 2
Physics

Chairperson: **J. Meier**

- R. Hjelm**
New Mexico Consortium
Interrelation of molecule scale polymer melt response to shear and rheology in the non-linear rheological domain
- S. Kheirandish**
Arlanxeo Deutschland GmbH
Non-Linear Strain Measures and Elongational Rheology of Branched Butadiene-Based Polymers
- F. Kremer**
University of Leipzig
Molecular dynamics at external and internal nanometric constraints

Session 3
Vulcanization

Chairperson: **H.-J. Weidenhaupt**

- L. Klafke de Azeredo**
Dätwyler Sealing Solutions
A more efficient calculation of vulcanization time from the use of isothermal and non-isothermal kinetics for EPDM based rubber compounds with different types of peroxides
- B. Basterra Beroiz**
Goodyear Innovation Center Luxembourg
Network structures in carbon black filled rubbers: Towards a quantitative analysis
- A. Blume**
Evonik Resource Efficiency GmbH
Determination of the crosslink density of tire tread compounds - Which analytical method delivers the most reliable results?

Following the lectures

POSTER SESSION



Wednesday, November 7, 2018

Session 1
Aging and Lifetime

Chairperson: **M. van Duin**

- 08:30** **T. Krups**
Deutsches Institut für Kautschuktechnologie e.V.
Aging stability of sealing materials in lubricants
- 09:05** **N. Meghiref**
LRCCP
Multi-scale and multi-technique analysis of acrylonitrile content on the thermal aging of peroxide cured HNBR
- 09:40** **M. Hemstede-van-Urk**
ARLANXEO Netherlands B.V.
Therban HT - a plastic re-inforced HNBR with improved high temperature properties

Session 2
Processing

Chairperson: **B. Klie**

- S. Teich**
Deutsches Institut für Kautschuktechnologie e.V.
The influence of the rubber recipe on the adhesion between PA and EPDM in a multi-component injection molding process
- S. Kammer**
Institut für Kunststoffverarbeitung
Efficiency analysis of different continuous vulcanization types
- S. Breithaupt**
Deutsches Institut für Kautschuktechnologie e.V.
Application of LIBS to analyze the distribution of mixing additives

Session 3
Analysis

Chairperson: **D. Bielinski**

- J. Ludwig**
Ludwig Nano Präzision GmbH
Determination of spatially resolved elastomer parameters by the method of Micro-Indentation
- E. Euchler**
Leibniz-Institut für Polymerforschung Dresden
Exploring the failure behavior of rubber vulcanizates under constraint conditions via small-angle-X-ray-scattering
- Y. Aoyagi**
Freudenberg Technology Innovation SE & Co. KG / DIK
The analysis of aging processes of EPDM-elastomers using low field NMR and stress relaxation measurements

10:10

COFFEE BREAK



Wednesday, November 7, 2018

Session 1
Reinforcement

Chairperson: **J. Noordermeer**

- 10:40** **W. Dierkes**
University of Twente
Silane-grafted natural rubber as compatibilizer in silica-reinforced natural rubber
- 11:15** **I.H. Syed**
Continental Reifen Deutschland GmbH
Characterizing the influence of reinforcing resin on the mechanical response of filled elastomers
- 11:50** **N. Gundlach**
Bergische Universität Wuppertal
Modelling Filler Dispersion in Elastomers: Relating Filler Morphology to Interface Free Energies via SAXS and TEM Simulation Studies

Session 2
Processing

Chairperson: **B. Klie**

- G. Nijman**
KraussMaffei Berstorff GmbH
Rubber extrusion screw lay out based on rheological behavior of the material.
- M. Drach**
Institut für Kunststoffverarbeitung (IKV)
Optimization of screw geometry for silicone extruder considering wall slip behaviour
- S. Kammer**
Institut für Kunststoffverarbeitung (IKV), RWTH Aachen
Foam extrusion of elastomers using water as physical blowing agent

Session 3
Analysis

Chairperson: **K. Nakajima**

- M. Wilhelm**
Karlsruhe Institute of Technology (KIT)
Medium Resolution 1H-NMR at 62 MHz as Chemically Sensitive Online Detector for Size Exclusion Chromatography (SEC-NMR)
- F. Grunert**
University of Twente
Comparison and Evaluation of Different Analytical Methods to Predict the In-Rubber Dispersibility of Silica
- D.H.C. Wong**
Eastman Chemical Company
Evaluation of Sulfur Dispersion using Population Survival Analysis

12:20

LUNCH



Wednesday, November 7, 2018

Session 1
Simulation

Chairperson: **M. Klüppel**

- 13:20** **H. Baaser**
Univ. of Applied Sciences Bingen
*Constructing the Transfer Function of any
Topology of Rheological Elements by Numerical
Laplace Transformation*
- 13:55** **K.N. Vu**
Department of Continuum Mechanics, RWTH
Aachen University
*Physically-based modeling of strain-induced
crystallization in natural rubber*
- 14:30** **C. Krauter**
Schrödinger GmbH
*Unravelling critical polymer properties with
efficient computational approaches*
- 15:05** **H. Wulf**
Chemnitz University of Technology
*Using an abstract model of rubber microstructure
to predict rubber compound properties*

Session 2
Materials

Chairperson: **S. Kawahara**

- M. Galimberti**
Politecnico di Milano
*Facile and sustainable functionalization of sp²
carbon allotropes, as fillers for rubber composites*
- P. Bernal Ortega**
Institute of Polymer Science and Technology
*Sulfur-modified carbon nanotubes for the
development of advanced elastomeric materials*
- A. Shakun**
Tampere University of Technology
*Study of material-related losses in nanodiamond-
rubber composites*
- M. Omelan**
Deutsches Institut für Kautschuktechnologie e.V.
*Development of PDMS nanocomposites for
neuro-medical application*

Session 3
Materials

Chairperson: **R. Schuster**

- M. Martinez Velencoso**
Kuraray Europe GmbH
*Modified Compound Characteristics with Liquid
Rubber*
- M. De Greiff Palacio**
Proantex S.A.S
*Skim-Latex: Is it really the source of low
specification rubber?*
- B. Pary**
*The 3D Dandelion concept: a paradigm change
to establish a financially viable alternative to
Hevea Natural Rubber*
- H. Dikland**
Arlanxeo Deutschland GmbH
*Therban® with improved media resistance and
low temperature flexibility*

15:35

COFFEE BREAK



Wednesday, November 7, 2018

Session 1
Materials

Chairperson: **H. Dikland**

- 16:05** **A.F. Halasa**
University Akron
Structural Engineering of 1,3-Butadiene Polymers for Novel Diblock Copolymers and its Hydrogenated Properties
- 16:40** **L. Rodriguez-Guadarrama**
Dynasol Group
In-chain Functionalized SEBSs for Rubber-Silica Network
- 17:15** **M. Boomhoff**
Trinseo Deutschland GmbH
Functionalized SSBR for Fuel Efficient & Safe Tires

Session 2
Analysis

Chairperson: **I. Chodak**

- K. Nakajima**
Tokyo Institute of Technology
Viscoelasticity of rubbers investigated by nanorheological AFM
- C. Karl**
Fakultät für Bauingenieurwesen und Geodäsie,
ForWind/Leibniz-Universität Hannover
Wetting of elastomer surfaces
- E. Ueda**
Zeon Corporation
Nanorheological atomic force microscope for silica-filled SBR vulcanizes

Session 3
Vulcanization

Chairperson: **A. Blume**

- M. van Duin**
Keltan R&D, ARLANXEO Performance Elatomers
Sulfur vulcanisation of low- and high-unsaturated rubbers (IIR & EPDM vs. NR & BR)
- H.-J. Weidenhaupt**
LANXESS Deutschland GmbH
The Way to Improve Network Performance
- E. Cansell**
ArianeGroup
Study of vulcanization bonding process' mechanisms of natural rubber onto metallic substrates

19:00

SOCIAL EVENT



Thursday, November 8, 2018

Session 1
Analysis

Chairperson: **T. Nishi**

08:30 **N.N.**

J.-U. Walter
Universität Paderborn, Kunststofftechnik
Paderborn (KTP)
Scale Up of "Garvey-die" test setup

I. Chodak
Polymer Institute of the Slovak Academy of
Sciences
*Behavior of mixtures of various rubbers with
electroconductive carbon blacks under cyclic
mechanical stress*

09:05 **D. Nichetti**
Rheonic srl
*Oscillating Shear Capillary Rheometry (OSCAR)
of Rubber Compounds*

J. Jennissen
RADO Engineering GmbH
Strainer process issues

M. Kröger
IMKF - TU Bergakademie Freiberg
Roughness influence on adhesion

09:40 **M. Yazici**
Uludag University Engineering Faculty,
Automotive Eng. Dept.
*Investigation of the Crack Propagation in The
Graphene/Elastomer Nanocomposite Materials
with DIC Technique*

A. Lipski
Institute of Plastics Processing (IKV) in Industry
and the Skilled Crafts at RWTH Aachen
University
*Flow paths in a tangential internal mixer -
Visualization and analysis for an optimized mixing*

M. Jaunich
Bundesanstalt für Materialforschung und -
prüfung (BAM)
*Low temperature properties of rubber seals -
Influence of crystallite formation on seal
performance -*

10:10

COFFEE BREAK



Thursday, November 8, 2018

Session 1
Simulation

Chairperson: **H. Baaser**

- 10:40** **C. Liu**
Beijing Univ. of Chemical Technology
Fabrication of advanced elastomer nanocomposites designed by computer simulation towards extremely energy-saving tires
- 11:15** **S. Gelke**
Chemnitz University of Technology
A material model for the thermomechanical simulation of rubber
- 11:50** **C. Penisson**
BMW Group
Designing rubber subframe mounts in the pre-development phase

Session 2
Reinforcement

Chairperson: **G. Heinrich**

- H. Westenberg**
Orion Engineered Carbons GmbH
Tuning electrical conductivity by applying a tailored carbon black morphology
- A. Bernardi**
Politecnico di Milano
Facile and sustainable functionalization of carbon black, as filler for rubber composites
- R. Hickmann**
TU Dresden, ITM
Innovative hybrid-yarns for textile reinforced elastomer components

Session 3
Tires

Chairperson: **W. Dierkes**

- E. Borchardt**
Continental Reifen Deutschland GmbH
Processing behaviour of highly filled SBR compounds - A lab evaluation using the 'Garvey-die' test setup
- M. Heinz**
Evonik Resource Efficiency GmbH
Influence of Polymer Type, Filler Property and Coupling System on Crosslink Density of Summer Tire Tread Compounds
- U. Hong**
Hyundai Motor Company
Study on the effect of aging on the internal parts of tires

12:20

LUNCH



Thursday, November 8, 2018

Session 1
Materials

Chairperson: **I. Hudec**

- 13:20** **S. Kawahara**
Nagaoka University of Technology
Preparation and Mechanical Properties of Natural Rubber with Nanodiamond Nanomatrix Structure
- 13:55** **H. Murakami**
Nagasaki University
Thermal and Elastic Properties of Polyurethanes Crosslinked by Polyoxanes
- 14:30** **N. Rennar**
formerly: University of Applied Sciences Würzburg
Synthesis, Structure, and Properties of Rigid Rod Networks
- 15:05** **G. Heinrich**
Leibniz-Institut für Polymerforschung Dresden e.V.
Ionic modification and weak cross-links in polymer networks: a new paradigm for robust rubbers?

Session 2
Aging and Lifetime

Chairperson: **U. Giese**

- B. Schritteser**
Polymer Competence Center Leoben GmbH
Effect of swelling and thermal induced ageing of HNBR in oil and gas field applications
- H. Benning**
Baker Hughes, a GE company
Elastomer Development for Oil Based Mud Moineau Motors
- B. Karaagac**
Kocaeli University, Chemical Engineering Department
Improved Crosslink Structure and Thermal Resistance of EPDM Formulations
- M. Achenbach**
Ingenieur- und Sachverständigenbüro Achenbach GbR
Life Time Prediction of Seals by Numerical Simulation

Session 3
Tires

Chairperson: **M. Klüppel**

- F. Grasso**
Versalis S.p.A.
Developing solutions for truck tyres
- J. Vervelde**
Kraton Chemical B.V.
The influence of tread enhancement additives on the performance of filled tread compounds - an insight into the effect of SYLVATRAXX™
- R. Stoczek**
PRL Polymer Research Lab, s.r.o.
Influence of loading force on resistance against chipping and cutting phenomena of fundamental rubber materials
- F. Abraham**
University of Plymouth
Abrasion Resistance and Fatigue Crack Growth in Dependence of Recycled Tyre Filler Content and its Interface Morphology

15:45

CLOSING REMARKS

See you in Hannover



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