

37th Annual Conference of the North American Thermal Analysis Society 2009

Lubbock, Texas, USA
19-23 September 2009

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The 37th Annual Conference on Thermal Analysis and Applications

Sunday, September 20, 2009

Reception and Poster Session

Banquet Hall, Lubbock Memorial Civic Center

Christoph Schick, Universitaet Rostock

Gordon Meyer, Applied Technical Services

18:00 to 21:00

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Increased Productivity by Power Controlled DSC

P. Ye, K. Menard, A. Salamon

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P. Ye, K. Menard, A. Salamon

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Student Posters
Banquet Hall, Lubbock Memorial Civic Center
Christoph Schick, Universitaet Rostock
Gordon Meyer, Applied Technical Services
18:00 to 21:00

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Monday, September 21, 2009
Morning Sessions
Christoph Schick, Universitaet Rostock
Gordon Meyer, Applied Technical Services
Technical Program Co-Chairs
Banquet Hall

8:00 - 8:10 **Greetings and Plenary Lecture**

8:10 - 8:50 **A Lifetime in Research**
V. Mathot
SciTe B.V. and Katholieke Universiteit Leuven

Energetic Materials and Thermal Hazards
In Honor of Dr. David Jones, Canadian Explosives Research Laboratory
Room 107
Ted Charsley, University of Huddersfield
Chair

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J. E. Houston

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F. Wang, Y. Wang, H. Lu

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B. Xu, J. Wu, G. B. McKenna

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J. Ma, J. Wallace, D. Gravé, P. M. McGuigan

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A. M. Forster, H. Lakrout, L. Sung, C. A. Michaels, D. Wang

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V. Ganesan

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Christoph Schick, Universitaet Rostock
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M. Pyda

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Meihan Wang, SONY Institute of Higher Education

Takahisa Tsugoshi, National Institute of Advanced Industrial Science and Technology

Co-Chairs

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R. Ozao, Y. Nishimoto, T. Tsugoshi

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T. Tsugoshi, Y. Nishimoto

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M. Saraji, M. Eschner, T. Streibel, M. Sklorz, T. Denner, E. Kaisersberger, R. Zimmermann

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Monday Luncheon
Sponsored by Mettler-Toledo
Banquet Hall
12:00 to 13:30

Monday, September 21, 2009
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Energetic Materials and Thermal Hazards
In Honor of Dr. David Jones, Canadian Explosives Research Laboratory
Room 107
Brandon Weeks, Texas Tech University
Chair

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Greg McKenna, Texas Tech University

Chair

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Honorary Session for Vincent Mathot
Room 111/112
Andreas Wurm, Universitaet Rostock
Chair**

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Room 104/105

Connie Roth, Emory University

Chair

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Inorganic Materials, Nanoporous Materials, and Ceramics

Room 110

Iris Rivero, Texas Tech University

Shiren Wang, Texas Tech University

Co-Chairs

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Frank D. Blum, Missouri University of Science and Technology
Chair**

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**Monday Evening Reception
Cap*Rock Winery
18:00 to 22:00
Buses leaving Holiday Inn from 17:45 pm - 18:45 pm**

Tuesday, September 22, 2009
Morning Sessions
Christoph Schick, Universitaet Rostock
Gordon Meyer, Applied Technical Services
Technical Program Co-Chairs
Banquet Hall

- 8:00 - 8:10 **Greetings and NATAS Award for Outstanding Achievement Lecture**
- 8:10 - 8:50 **Quiescent Crystallization of Model Poly(propylenes): Role of Defect Microstructure**
R. G. Alamo
Florida Agricultural and Mechanical University and Florida State University
-

Energetic Materials and Thermal Hazards
Room 107
Ted Charsley, University of Huddersfield
Chair

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-

- 9:40 - 10:00 **Thermal Study Of The Interaction Of Acetone Peroxide With Nitroexplosives**
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-

- 10:00 - 10:20 **Effects of Various Fire-Extinguishing Reagents on Triacetone Triperoxide**
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-

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-

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C. Badeen, R. Turcotte, E. Hobenshield, S. Beretta
-

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M. L. You, C. P. Lin, M. Y. Liu, Y. C. Chou, C. M. Shu

Rheology
Room 108/109
Wei Zhang, Texas Tech University
Chair

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Nanocomposites
Room 104/105
Brain Grady, University of Oklahoma
Chair

9:00 - 9:40 **Polymer Nanocomposites: Structure and Properties**

L. Cui, D. R. Paul

9:40 - 10:00 **The Thermal Pressure Coefficient of a Polyhedral Oligomeric Silsesquioxane (POSS)-Reinforced Epoxy Resin**

K. Z. Win, T. Karim, Q. Li, S. L. Simon, G. B. McKenna

10:00 - 10:40 **Break**

10:40 - 11:00 **Relating Matrix Crystallinity to Polymer Nanocomposite Properties**

M. L. Shofner, J. Kaur, J. H. Lee

11:00 - 11:20 **Porous Yttrium Oxide Materials Prepared by Epoxide Addition Method**

P. D. Brown, L. J. Hope-Weeks

11:20 - 11:40 **Porous Aerogel Networks of Noble Metal Coated Semiconductor Nanoparticles**

S. K. Gill, L. J. Hope-Weeks

Fast Scan/MDSC

Room 111/112

**Arun Pratap, The Maharaja Sayajirao University of Baroda
Chair**

10:00 - 10:20 **Characterisation of Paracetamol Form III with Rapid-Heating DSC 274**

A. B. Mohamed Buanz, S. Gaisford

10:20 - 10:40 **Dynamics of Adsorbed Polymers Using Temperature Modulated Differential Scanning Calorimetry**

F. D. Blum

10:40 - 11:00 **Examination of Low Heat Capacity Materials using Modulated DSC**

J. Saienga, L. Waguespack

11:00 - 11:20 **Using Modulated Differential Calorimetry to Investigate the Effect of Mix-Ratio on an Epoxy Thermoset System**

L. E. Waguespack, J. A. Browne, J. E. Saienga

11:20 - 11:40 **Modelling of Temperature-Modulated Calorimetry and the Frequency-dependent Specific Heat**

A. Lion, B. Yagimli

11:40 - 12:00 **Kinetics of Crystallization of Multi-Component Amorphous Alloys Using Modulated Differential Scanning Calorimetry**
A. Pratap, K. N. Lad

**Thermal Conductivity
Room 110
Robert Campbell, Netzsch Instruments
Chair**

10:00 - 10:40 **The Effect of in-situ Precipitation Phenomena on the Thermoelectric Properties of PbTe-PbS**
S. N. Girard, M. G. Kanatzidis

10:40 - 11:00 **Thermal Conductivity of Nano Modified Pitch Based Carbon Fibers: Understanding Experimental Results through Finite Element Modeling 282**
R. M. Alway-Cooper, M. Theodore, D. P. Anderson, A. A. Ogale

11:00 - 11:20 **Characterizing Thermal and Electrical Conductivity of Carbon Fiber-Reinforced Composites Using Long MWNT and K-1100 Carbon Yarn 287**
M. M. Zimmer, Q. Cheng, S. Li, R. Liang, B. Wang

11:20 - 11:40 **Effects of Compression on Thermal Resistance of Elastomeric Pads 298**
K. F. Schoch, Jr., J. D. Clifton, P. A. Panackal

11:40 - 12:00 **Thermophysical Properties of Pyrex 7740 Glass over the Temperature Range of -180C to 450C**
R. C. Campbell, I. A. Beta, M. G. Manuelian

**Tuesday Luncheon
Sponsored by NATAS
Banquet Hall
12:00 to 13:30**

Tuesday, September 22, 2009

Afternoon Sessions

**Christoph Schick, Universitaet Rostock
Gordon Meyer, Applied Technical Services
Technical Program Co-Chairs
Banquet Hall**

- 13:20 - 13:30 **NATAS Student Award Presentation and Lecture**
- 13:30 - 13:50 **Nuclei Formation in PCL in a Wide Range of Time and Temperature Studied by Fast Scanning Calorimetry 310**
E. Zhuravlev, C. Schick
University of Rostock
-

**Energetic Materials and Thermal Hazards
Room 107
Brandon Weeks, Texas Tech University
Chair**

- 14:00 - 14:20 **Thermal Analysis of Pentaerythritol Tetranitrate and Development of a Powder Aging Model 317**
G. W. Brown, M. M. Sandstrom, D. C. Monroe
-
- 14:20 - 14:40 **Comparisons of MWCNTs and Acidified Process by HNO₃ on Thermal Stability by DSC and TGA-FTIR**
Y. C. Chou, T. F. Hsieh, Y. C. Hsieh, C. P. Lin, C. M. Shu
-
- 14:40 - 15:00 **Runaway Reaction of Methyl Ethyl Ketone Peroxide Mixed with H₃PO₄ or H₂SO₄ by TAM III Tests**
J. M. Tseng, Y. P. I, H. C. Chang, C. M. Shu
-
- 15:00 - 15:20 **Lithium Batteries, Highly Energetic Materials: The Vaired Use of Adiabatic Calorimetry to Aid Safety 328**
M. Ottaway
-
- 15:20 - 15:40 **Fire and Explosion Prevention of Three Organic Peroxides Combined with Various Extinguishing Media by Differential Scanning Calorimetry**
S. H. Wu, J. R. Chen, C. M. Shu
-

15:40 - 16:00 **Break**

16:00 - 16:20 **Runaway Reaction of Lauroyl Peroxide with Nitric Acid by DSC**
M. L. You, J. M. Tseng, M. Y. Liu, J. M. Wei, C. M. Shu

16:20 - 16:40 **Evaluation for Thermal Hazard of Hydrogen Peroxide Mixing with Propanone Employing Calorimetric Approaches**
S. H. Wu, J. R. Chen, C. C. Chiu, W. H. Lin, C. M. Shu

16:40 - 17:00 **Thermal Effects on Impact Sensitivity of High Explosives**
G. Zhang, B. L. Weeks

17:00 - 17:20 **Effects of Flammability Characteristics of Methane with Three Inert Gases**
N. K. Lin, C. C. Chen, H. J. Liaw, Y. M. Chang, C. M. Shu

17:20 - 18:20 **Workshop: Effect of Experimental Conditions on the Thermal Results for Energetic Materials**
Moderator: Wim de Klerk

Nanocomposites
Room 104/105
Meisha Shofner, Georgia Institute of Technology
Chair

14:00 - 14:40 **Creation and Application of Aligned Macroscopic Carbon Nanotube Forests**
R. Vajtai, P. M. Ajayan

14:40 - 15:00 **Dispersion of Carbon Nanotubes in Superacids for the Production of High-Performance Materials**
M. J. Green, A. N. G. Parra-Vasquez, N. Behabtu, M. Pasquali

15:00 - 15:20 **Low Coefficient of Thermal Expansion of Polymer Nanocomposites**
S. Wang

15:20 - 16:00 **Break**

16:00 - 16:40 **Graphene-based Materials**
R. S. Ruoff

16:40 - 17:00 **Thermomechanical Properties of Composites with Chemically-Modified Graphene as Filler**
J. Potts, S. H. Lee, R. Ruoff

Kinetics
Room 108/109
Sergey Vyazovkin, University of Alabama at Birmingham
Chair

14:00 - 14:40 **Advanced Isoconversional Method Applied to Complex Cure of Epoxy/Clay Nanocomposites**
C. Alzina, A. Mija, L. Vincent, N. Sbirrazzuoli

14:40 - 15:00 **Application of Isothermal, Isoconversional Analysis to Characterize the Anion Exchange Kinetics of Nanodimensional Layered Metal Hydroxides 335**
J. M. Hossenlopp, S. Majoni

15:00 - 15:20 **PMMA/Organomodified Montmorillonite Nanocomposites Prepared by In-Situ Bulk Polymerization: Study of the Reaction Kinetics using Differential Scanning Calorimetry 343**
D. S. Achilias, A. K. Nikolaidis, G. P. Karayannidis

15:20 - 15:40 **Kinetic Analysis of Thermal Decomposition of Some Imidazole Derivative Complexes with Cd(II), Co(II) And Ni(II) Ions Using Multi-Heating Rate Kinetic Methods**
S. Vecchio, S. Materazzi, K. Kurdziel

15:40 - 16:00 **Break**

16:00 - 16:20 **Crystallization Kinetics of Zirconia Gel under Controlled Water Vapor Pressure**
N. Koga, T. Tatsuoka

16:20 - 16:40 **Use of Sample Controlled Thermal Analysis Methods for the Study of the Kinetics of Solid-State Reactions**
L. A. Perez-Maqueda, P. E. Sanchez-Jimenez, A. Perejon, J. M. Criado

16:40 - 17:00 **Kinetics of Oxidation of Aluminum Powders in Mixtures of O₂, CO₂, and H₂O**
X. Zhu, M. Schoenitz, E. L. Dreizin

17:00 - 17:20 **Crosslink Density Dependence of Diffusion Kinetics: Eyring Approach to Mechanism 352**
V. V. Krongauz

17:20 - 17:40 **Revisiting the Concept of Experimental Time Scale in the Relaxation of Amorphous Materials**
R. Pinal, C. Mao, S. P. Chamarthy

17:40 - 18:00 **Novel Applications of Isoconversional Kinetic Analysis**
S. Vyazovkin

Amorphous Materials and Phases
Room 110
Nandika D'Souza, University of North Texas
Peggy Cebe, Tufts University
Co-Chairs

14:00 - 14:40 **Leveraging Enhanced Surface Dynamics to Prepare Extraordinarily Stable Organic Glasses**
K. L. Kearns, S. F. Swallen, H. Huth, M. Ahrenberg, C. D. Schick, M. D. Ediger

14:40 - 15:20 **Thermal Relaxation in Amorphous Materials**
R. Richert

15:20 - 16:00 **Rigid Amorphous Phase of Biodegradable Poly(lactic acid) by Thermal Analysis**
M. Pyda

16:00 - 16:20 **Volume Recovery of Glasses: Jump Size effects**
F. Begum, S. L. Simon

16:20 - 16:40 **Short and Medium Range Glass Structure, and Mechanical Properties of Yttrium Aluminosilicate Glasses: a Molecular Dynamics Simulation Study 363**
J. Du

16:40 - 17:00 **Dynamic Compressive Behavior of Macro/mesoporous Silica Aerogels**
H. Lu, H. Luo, G. Churu, N. Leventis

17:00 - 17:20 **Influence of Type and Size of Nanoparticles on the Thermal Behavior of**

Amorphous Polystyrene Nanocomposites

M. M. Ruggles, P. Bernazzani

17:20 - 17:40 **Rigid Amorphous Fraction in Electrospun Nanofibers with Multi-Wall Carbon Nanotubes**

H. Chen, Z. Liu, P. Cebe

17:40 - 18:00 **Effect of Stress and Recovery on the Relaxation of Cyclobutanediol (CBDO) Glasses**

A. Shaito, C. Powell, G. Beall, N. A. D'Souza

18:00 - 18:20 **Aging of Colloidal Suspension of Thermosensitive Particles**

K. Z. Win, G. B. McKenna, T. Narita, F. Lequeux, S. Pullela, Z. Cheng

Advances in Instrumentation and Methods

Room 111/112

Riko Ozao (SONY Institute of Higher Education)

Chair

14:00 - 14:20 **High-Temperature X-Ray Reflectivity (XRR) And X-ray Diffraction (XRD) As Novel Thermal Analyses: Application To Organic Light-Emitting Thin Films 369**

M. H. Wang, T. Konya, Y. Sawada, T. Uchida, H. Lei, Y. Hoshi

14:20 - 14:40 **Isothermal Crystallization Studies Utilize New DSC Fast Cooling Features**

A. W. Salamon, R. Packer, P. Ye, K. Menard

14:40 - 15:00 **Improved Humidity and Immersion Testing in DMA**

J. Lang, K. Menard, P. Royall

15:00 - 15:20 **Dynamic Mechanical Analysis under Controlled Conditions of Temperature and Relative Humidity 376**

S. R. Aubuchon

15:20 - 16:00 **Break**

16:00 - 16:20 **The Measurement of Surface Rheological and Surface Adhesive Properties using Nanosphere Embedment**

S. A. Hutcheson, G. B. McKenna

16:20 - 16:40 **Microfluidics to Characterize Crystallization Behavior in Lipids**
S. A. Vanapalli

16:40 - 17:00 **Dielectric Study of Glassy Polymers Using Pulse Probe Technique 384**
S. Kollengodu Subramanian, G. B. McKenna

17:00 - 17:20 **New PerkinElmer Fast Scan DSC**
P. Ye, K. Menard, A. Salamon, R. Packer

17:20 - 17:40 **DSC and TMA Analyses of Thin Polymeric Multilayer Films**
A. Hammer, R. Riesen

17:40 - 18:00 **Fast Comprehensive Analysis of Evolved Organic Gases in Thermogravimetry: Application of Comprehensively Coupled Fast GC and Photo-Ionisation MS for On-Line Characterization of Polymer Decomposition (TG-GCxMS)**
M. Sariji, M. Eschner, T. Groger, R. Geissler, R. Zimmermann

18:00 - 18:20 **Use of DSC and DMA to Study Rubber Crystallization as a Possible Cause for a Tear in a Neoprene Glove Used in a Space Shuttle Pressurized Astronaut Suit 389**
C. D. Wingard

NATAS Business Meeting
Room 107
18:30 to 19:00

Reception and Banquet
Holiday Inn, Atrium and Petroleum Room
19:00 to 22:00

Wednesday, September 23, 2009
Morning Sessions

Christoph Schick, Universitaet Rostock

**Gordon Meyer, Applied Technical Services
Technical Program Co-Chairs
Banquet Hall**

8:00 - 8:10 **Greetings and Plenary Lecture**

8:10 - 8:50 **Nanocalorimetry on the Nanometer and Nanogram Scale**
L. H. Allen
University of Illinois at Urbana

**Energetic Materials and Thermal Hazards
Room 107
Ted Charsley, University of Huddersfield
Brandon Weeks, Texas Tech University
Co-Chairs**

9:00 - 9:20 **Enhanced Use of the Accelerating Rate Calorimeter to Study Energetic Materials 399**
M. Ottaway

9:20 - 9:40 **A New Era of Accelerating Rate Calorimetry 403**
F. Wu

9:40 - 10:00 **A New Benchtop Calorimeter for Studying Thermal Hazards and Chemical Process Safety**
P. J. Rabovsky, S. Chippett

10:00 - 10:40 **Break**

10:40 - 11:00 **Evaluations of Fire and Explosion for the Mixtures of Benzene and Methanol using Rough Set Method**
Y. M. Chang, M. L. You, Y. L. Wang, C. P. Lin, C. M. Shu

11:00 - 11:20 **Modeling Thermal Explosion of a Reactor Containing Tert-Butyl Peroxybenzoate**
C. P. Lin, J. M. Tseng, Y. M. Chang, Y. L. Wang, C. M. Shu

11:20 - 11:40 **Applying Grey System Theory to Rank the Influence Factors in the Benzene and Methanol Mixtures of Fire and Explosion Hazard Evaluation**
Y. M. Chang, M. L. You, J. M. Tseng, C. P. Lin, C. M. Shu

11:40 - 12:00 **Thermal Analysis of Tert-Butyl Peroxybenzoate and Tert-Butyl Peroxybenzoate Mixed with Benzoyl Peroxide**
Y. C. Cheng, J. M. Tseng, T. S. Wang, K. H. Chen, C. M. Shu

Kinetics
Room 108/109
Sergey Vyazovkin, University of Alabama at Birmingham
Chair

9:00 - 9:20 **Developing Guidelines for Kinetic Computations: a New ICTAC Project**
S. Vyazovkin

9:20 - 10:00 **Influence of Melting Conditions on Kinetics of Polymer Crystallization: Poly(3-hydroxybutyrate) 411**
M. L. Di Lorenzo, P. Sajkiewicz, A. Gradys, P. La Pietra

10:00 - 10:20 **Kinetics of Cooperative α -Process and Plasticizing Effect of Water in Natural Polymers**
A. Mija, N. Guigo, L. Vincent, N. Sbirrazzuoli

10:20 - 11:00 **Break**

11:00 - 11:20 **Onset Degradation Kinetics of Ethylene-tetrafluoroethylene 421**
P. R. Hondred, S. Yoon, N. Bowler, M. R. Kessler

11:20 - 11:40 **Application of Isoconversional Kinetic Analysis of Liquid MF Resin Cure for the Prediction of Decorative Laminate Surface Properties 431**
A. Kandelbauer, G. Wuzella, A. R. Mahendran, I. Taudes, P. Widsten

11:40 - 12:00 **Oxidation and Ignition of Aluminum and Aluminum-Based Energetic Composites at High Heating Rates**
B. Patel, M. Schoenitz, E. L. Dreizin

Biopolymers, Biomaterials, and Food Science
Room 104/105
Noureddine Abidi, Texas Tech University
Chair

- 9:00 - 9:20 **Analysis of a Gel Materials by Using Calorimetric Techniques**
N. D. Hesse, T. Chen, L. Waguespack, J. Saienga
-
- 9:20 - 9:40 **Characterization of Biodegradable Polymer Composites Bone Plates: The Effect of SWNTs**
M. D. Wilting, S. E. Swain, I. V. Rivero, O. L. A. Harrysson, D. J. Marcellin-Little
-
- 9:40 - 10:00 **Crystallization and Melting of Fibrous Silk Protein by Fast Calorimetric Methods**
A. Wurm, D. Arbeiter, X. Hu, D. Kaplan, P. Cebe, C. Schick
-
- 10:00 - 10:20 **Crystallization Kinetics and Self-assembly of Beta Sheet Crystals in Silk Multiblock Proteins**
X. Hu, Q. Lu, D. Kaplan, P. Cebe
-
- 10:20 - 11:00 **Break**
-
- 11:00 - 11:20 **Mechanics of DPPC Multibilayers: Surface Properties by Particle Embedment Technique**
J. Wang, K. Deshpande, G. B. McKenna
-
- 11:20 - 11:40 **pMDI-Reinforced Compression-Molded PCL/Gluten: Thermo-mechanical Properties**
A. Mohamed, P. Rayas-Duarte, V. L. Finkenstadt
-
- 11:40 - 12:00 **Thermogravimetric Analysis as a Tool to Study the Secondary Cell wall Biogenesis in Cotton Fibers 439**
N. Abidi, L. Cabrales, E. Hequet
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**Thermosets
Room 110
Mike Kessler, Iowa State
Bryon Bilyeu Xavier University
Co-Chairs**

- 9:00 - 9:40 **Thermal Analysis of Thermosetting Polymers: Fundamentals and Applications 443**
R. B. Prime, H. E. Bair
-

- 9:40 - 10:20 **Room Temperature Ionic Liquids (RTILs) as Thermally Latent Initiators for Epoxy Resins**
G. R. Palmese
-
- 10:20 - 11:00 **High Glass Transition Temperature Thermosets Made by Click Chemistry**
N. Le Baut, D. D. Diaz, S. Punna, M. G. Finn, H. R. Brown
-
- 11:00 - 11:20 **Spontaneous Embedment of Submicron Particles: An Investigation of the Distribution of the Surface Mechanical Properties in an Epoxy Nanocomposite**
T. B. Karim, G. B. McKenna
-
- 11:20 - 11:40 **Studies about the Curing Behavior of EVA in Photovoltaic Modules**
K. Wiegel, A. Hammer, R. Riesen, S. Sauerbrunn
-
- 11:40 - 12:00 **Aspects of Physical Ageing and Network Formation in Glassy Thermosets 445**
A. T. Detwiler, A. J. Lesser
-
- 12:00 - 12:20 **Efforts Toward the Preparation of Mobile (Slip-Link) Cross-Linked Polymeric Materials**
M. F. Mayer, S. Kang, Z. Xue, M. Gupta
-

Nanocalorimetry and Local Thermal Analysis
Recent Advances of the Nanocalorimetry Technique
Room 111/112
Maxim Nikiforov, Oak Ridge National Laboratory
Chair

- 9:00 - 9:40 **Combinatorial Calorimetry and Thermal Transport Measurements of Nanoscale Quantities of Materials using Membrane-based Thermal Sensors**
P. J. McCluskey, J. J. Vlassak
-
- 9:40 - 10:20 **Mono-crystalline Silicon Nanocalorimeter**
Y. Anahory, F. Schiettekatte
-
- 10:20 - 10:40 **Break**
-
- 10:40 - 11:00 **Non Adiabatic Thin-Film (Chip) Nanocalorimetry for Fast (10^6 K/s) Scanning Calorimetry on Cooling**

C. Schick, E. Zhuravlev, A. Minakov

11:00 - 11:20 **Actively Power Compensated Differential Scanning Calorimeter for Studying of Solidification of Metals and Polymers on Millisecond Time Scale**
E. Zhuravlev, C. Schick

11:20 - 11:40 **Microliter Liquid Calorimetry with Fast Heating Rate**
L. P. de la Rama, L. Hu, M. Y. Efremov, E. A. Olson, M. Mclean, L. H. Allen

Wednesday, September 23, 2009
Afternoon Sessions

Kinetics
Room 108/109
Sergey Vyazovkin, University of Alabama at Birmingham
Chair

14:00 - 14:20 **Comparison of Non-Isothermal Crystallization Kinetics of Molded Parts Based on Colorants by DSC**
J. A. Browne, L. E. Waguespack

14:20 - 14:40 **Measurements and Predictions of Outgassing from High Density Polyethylene, PBX 9502, and Certain Silicones by the Isoconversional Analysis 455**
L. N. Dinh, E. A. Glascoe, M. A. Schildbach, S. C. Chinn, R. S. Maxwell, W. McLean II

14:40 - 15:00 **Crystallization Kinetics of Metallic Glasses: Transformation Diagrams**
J. J. Suñol

15:00 - 15:20 **Simple Approximate Analytical Solutions for Non-Isothermal Single-Step Transformations: Application to the Kinetic Analysis of Experimental Data 461**
J. Farjas, P. Roura

15:20 - 15:40 **A Comparative Thermal Kinetic Investigation for the Nematic to Isotropic Phase Transition of nCB Liquid Crystals 471**
D. Sharma

15:40 - 16:00 **Kinetics Study of Crystallization Process in $\text{Fe}_{32}\text{Ni}_3\text{6Cr}_{14}\text{P}_{12}\text{B}_6$ Metallic Glass 481**

K. N. Lad, T. L. Shanker Rao, A. Pratap

16:00 - 16:20 **Break**

16:20 - 16:40 **Kinetic Analysis of the Multi-Step Process in the Formation of Lithium Cobalt Oxide**

E. H. Walker, Jr., S. A. Wicker, Sr.

16:40 - 17:00 **Simulation of the Minor Heat Release during Aging of Energetic Materials using Advanced Kinetic Elaboration of HFC Signals 488**

B. Roduit, P. Folly, A. Sarbach, B. Berger, M. Ramin, B. Vogelsanger

17:00 - 17:20 **The Deviation of Temperature Integral Caused By the Neglect of the Integral From 0 to T_0 in Non-Isothermal Kinetic Equation 500**

Y. Cheng, R. Shen

17:20 - 17:40 **Supplement on Applicability of the Kissinger Equation in Thermal Analysis 505**

Y. Li, Y. Cheng, Y. Ye, R. Shen

17:40 - 18:00 **Separated Determination of Carbon Black in Chloroprene Rubber by Simulation of Heating Rate Conversion 511**

N. Okubo, Y. Nishiyama, F. Klein, J. Rivas

Biopolymers, Biomaterials, and Food Science

Room 104/105

Nouredine Abidi, Texas Tech University

Patricia Rayas Duarte Oklahoma State University

Co-Chairs

14:00 - 14:20 **Relationships between Thermal Properties and Maturity-Fineness of Cotton Fibers and Estimation of the Primary Cell Wall Thickness 518**

N. Abidi, E. Hequet, L. Cabrales

14:20 - 14:40 **On the Thermal Degradation of Cellulose in Cotton Fibers Compared to Microcrystalline Cellulose (AVICEL) 523**

L. Cabrales, N. Abidi, E. Hequet

14:40 - 15:00 **The Melting and Glass Transitions of Carbohydrates 530**
A. Magon, M. Pyda

15:00 - 15:20 **Multiscale Modeling of Unsaturated Transport During Frying of Foods**
P. S. Takhar, J. Maneerote

15:20 - 15:40 **The Effect of Glass Transition on Darcian and non-Darcian Modes of Fluid Transport and Stress-Crack Formation in Biopolymers**
P. S. Takhar

15:40 - 16:00 **Studies about the Sorption/Desorption Behavior of Lactose and Starch**
M. Schubnell, R. Riesen

16:00 - 16:40 **Break**

16:40 - 17:00 **Stability of Fish Oil against Oxidation characterized by Chemiluminescence and Differential Isoconversional Kinetic Analysis 539**
F. Kaeser, B. Roduit

17:00 - 17:20 **Oxidation of Potato Chips: Correlation of Sensory Evaluation and Chemiluminescence Measurements of Oxidized Potato Chips 546**
F. Kaeser, H. Kneubuehler

17:20 - 17:40 **Exploration of Phase Transformations in Coffee Beans Using DSC and TGA**
J. Saienga, L. Waguespack

17:40 - 18:00 **Investigation of Cocoa Butter by DSC**
L. E. Waguespack, J. E. Saienga

**Nanocalorimetry and Local Thermal Analysis
Testing the Limits of Thermal Analysis Measurements
Room 111/112
François Schiettekatte, Université de Montréal
Chair**

14:00 - 14:40 **High Temperature Nanocalorimetry**
R. K. Kumamuru

14:40 - 15:00 **Transition Temperature Microscopy: Thermal Property Mapping of**

Polymers at the Micro and Nanoscale

K. Kjoller, L. T. Germinario, K. Sahagian, R. Shetty

15:00 - 15:20 **Single Molecular and Sub-Zeptoliter Thermal Probing**

R. Proksch

15:20 - 15:40 **The Hunt for Resolution while Mapping of Mechanical Properties and Tg in Polymer Materials using NanoTA method**

M. P. Nikiforov, S. Jesse, L. T. Germinario, S. Gam, R. C. Composto, S. V. Kalinin

15:40 - 16:00 **Dynamic Measurement of Nanoscale Thermal and Mechanical Property Development of Automotive Refinish Clearcoats using Band Excitation Atomic Force Acoustic Microscopy**

L. T. Germinario, M. P. Nikiforov, S. Jesse, D. Bhattacharya, A. M. Forster, S. V. Kalinin

16:00 - 16:20 **Break**

16:20 - 16:40 **Phase Behavior of Polyelectrolyte Multilayer Investigated by Thin Film Calorimetry**

H. Huth, R. Mueller, A. Fery, C. Schick

16:40 - 17:00 **Neel Temperature's Size-Dependence of the Antiferromagnetic Phase Transitions of CoO Ultra-Thin Films: A Nanocalorimetric Study**

M. Molina-Ruiz, A. F. Lopeandia, F. Pi, D. Givord, O. Bourgeois, J. Rodriguez-Viejo

17:00 - 17:20 **Nanocalorimetry as a Means to Study Extraordinarily Stable Glasses Prepared by Physical Vapor Deposition**

K. L. Kearns, H. Huth, M. Ahrenberg, C. Schick, M. D. Ediger

17:20 - 17:40 **Self-Assembly and Melting of Alkanethiolate on Ag: Nanocalorimetry Study**

L. Hu, Z. Zhang, M. Zhang, M. Y. Efremov, E. A. Olson, L. P. de la Rama, R. K. Kaumamuru, L. H. Allen

17:40 - 18:00 **Investigation of Oxide Nanoparticles by Means of AC-chip Calorimetry**

G. Guenther, O. Guillon, H. Hahn, G. Schiering, R. Theissmann, H. Huth and C. Schick

18:00 - 18:20 **Nanocalorimetry Measurements of the Heat Capacity and Enthalpy of Formation of Reacting Thin Films**

R. K. Kumamuru, L. P. De La Rama, L. Hu, M. D. Vaudin, M. Y. Efremov, M. L. Green, D. A. LaVan, L. H. Allen

**Combustion, Degradation, and Fire Science
Room 107
Bob A. Howell, Central Michigan University
Chair**

13:00 - 13:40 **Application of Thermal Analysis Techniques to Combustion and Thermal Degradation of Materials**

Q. Lineberry, H. Y. Zhao, W. P. Pan

13:40 - 14:00 **TG-MS and TG-GC/MS of Polymers**

K. Menard, W. Goodman, J. Lang

14:00 - 14:20 **Defect Responsible for the Thermal Instability of General Purpose Poly(styrene) 558**

B. A. Howell

14:20 - 14:40 **Thermal Degradation of Poly(propylene oxide) 567**

B. A. Howell, M. R. Alomari

14:40 - 15:00 **Photo-decomposition of Polymers by UV-DSC**

W. Brostow, K. Menard, N. Menard, J. Lang

15:00 - 15:20 **Effects of Total Pressure and Partial Pressure on the Pyrolysis and Gasification of PRB Coal**

Q. Lineberry, H. Zhao, Y. Cao, W. P. Pan

15:20 - 15:40 **Thermal Stability of Phosphinated Diethyl Tartrate and Derivatives 575**

B. A. Howell, K. E. Carter

15:40 - 16:00 **Break**

16:00 - 16:20 **Thermal Stability of Bidentate Nitrogen Ligands Tethered to Multiwall Carbon Nanotubes 586**

B. A. Howell, A. Dumitrascu

16:20 - 16:40 **Thermal Analysis and Degradation Phenomenon Identification of Ash-**

Based Zeolite

S. H. Wu, Y. Cao, W. P. Pan, C. M. Shu

16:40 - 17:00 **Thermal Decomposition of (1,2-Diaminocyclohexane)platinum(II) - Containing Antitumor Compounds 598**

B. A. Howell, P. Chhetri, A. Dumitrascu, K. N. Stanton

17:00 - 17:20 **Thermal Decomposition of 2,4,4,5,5-Pentaphenyl-1,3,2-dioxaphospholane and Related Compounds 607**

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17:20 - 17:40 **Thermal Analysis and Phenomenon Identification of Home-Made Zeolite**

S. H. Wu, Y. Cao, W. P. Pan, C. M. Shu

17:40 - 18:00 **The Use of Differential Scanning Calorimetry and Thermogravimetric Analysis for Development of Reaction Kinetics for Aluminum-Iodine Pentoxide Reactions 616**

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