TECHNICAL PROGRAM OF THE 44TH
NORTH AMERICAN
THERMAL ANALYSIS SOCIETY CONFERENCE

August 7-10, 2017

Clayton Hall – University of Delaware
Newark, Delaware

Conference Chair
Steve Sauerbrunn
University of Delaware
Center for Composite Materials

Technical Program Chair
Larry Judovits
Arkema

Exhibition Chair
Tina Adams
The Lubrizol Corporation

Award Chair
Andrew McGhie
University of Pennsylvania

Proceedings Chair
Elizabeth Pelczar
Innophos, Inc.

NATAS Staff Management
Greg Jewell
AEC Management Resources

The photographing or recording of any talk or poster without the author’s consent is prohibited.
Monday, August 7, 2017

Welcome Reception, General Poster Session, and Student Poster Session
Clayton Hall, Lobby
18:00 to 21:00

Plenary Lecture
Clayton Hall – Auditorium 128

17:00–17:10 Opening remarks

17:10–18:00 Seeking simplicity in the flows of complex fluids

 *H. Stone* (Princeton University)  PL-1

General Poster Session
Clayton Hall - Lobby
Tina Adams, Lubrizol (Session Chair)

Predicting product shelf-life by using advanced kinetics and statistical analyses on forced degradation data

 *D. Clenet* (Sanofi-Pasteur), *F. Imbert*, *P. Probeck*, *F. Ausar*, *N. Rahman*  GP-1

DSC measurement of gelation of aqueous methyl cellulose solutions containing polyethylene glycol and salt

 *E. Shimoda* (Hitachi High-Tech Science Corporation), *Y. Nishiyama*, *Y. Nishimoto*, *S. Mochida*  GP-2

Thermal analysis of light emitting diodes

 *H. Takahashi*, *Y. Kasai* (Hitachi High-Tech Science Corporation), *Y. Nishiyama*, *K. Shibata*, *B. Goolsby*  GP-3

Thermal analysis applications of printed circuit board using sample observation unit

 *Y. Nishiyama*, *Y. Kasai* (Hitachi High-Tech Science Corporation), *B. Goolsby*, *K. Shibata*  GP-4

Heat transfer for large scale lithium-ion batteries module by triggering thermal runaway

Reaction mechanism on propylene oxide reaction catalyzed by titanium silicate zeolite
C-M. Shu (National Yunlin University of Science and Technology), C-R. Cao, S-H. Liu, C-W. Wu

Analysis of accelerated determination method of thermal life of insulation materials using activation energy by TGA method and DSC method
Y. Li (Shanghai Electrical Apparatus Research Institute(Group) Co., Ltd), H. Huang, Z. Guan, S. Wang, Y. Zhang

Candy physics
D. Sharma (LC), M. McCarthy, M. Hatch, L. Sullivan, J. Vitello, T. Cloutier, H. Butler

Combustion characteristics and thermogravimetric analysis for coal slime
Y. Zhang, C. Zhang (North China Electric Power University), W-P. Pan

Powder flowability study to optimize mixing and predict final product properties: A study on PVC formulations
S. Reynaud (Arkema), R. Smith, M. Lavach, J. Lyons

Investigation of pan types for modulated DSC
E. Kowal (Arkema), Y. Wang, L. Judovits

An unusual phase transition in tri t-butylbenzene
A. McGhie (LRSM, University of Pennsylvania), G. J. Sloan, S. J. Szewczyk, P. A. Beckmann, A. L. Rheingold

Investigation of powder properties by using dynamic flow testing
L. Nebel (Arkema), S. Reynaud, M. Lavach

Zeolite pore size screening by thermogravimetric analysis
R. Zea (UOP/Honeywell)

Multiple phase transitions of low molecular weight hydroxypropyl methylcellulose and methylcellulose in the presence of salt and kappa-carrageenan
N. Almeida (Central Michigan University), L. Rakesh, J. Zhao
Influence of microstructure on ultrahigh thermal conductivity of mesophase pitch-based carbon fibers

*V. Bermudez (Clemson University), A. Ogale*  

Structure-property relationships of thai silk-microcrystalline cellulose biocomposite materials fabricated from ionic liquid

*K. Callaway (Rowan University), K. DeFrates, T. Markiewicz, Y. Xue, X. Hu*  

Empirical model for flammability limits and process safety evaluation for ethylene process under various initial pressures and temperatures via 20-L-apparatus

*B. Laiwang, S-C. Ho, J-R. Lin, T-H Lin, C-M. Shu, J-R. Chen (Hsiuping University of Science and Technology (HUST))*  

Thermal reaction of 1-butyl-3-methylimidazolium nitrate ionic liquids via copper catalyst

*B. Laiwang, Y-J. Chen, W-C. Lin, S-H. Liu (National Yunlin University of Science and Technology (YunTech)), C-M. Shu*  

Functionalization of pan-based carbon fiber for improved wetting and interfacial shear strength

*M. Kubota (University of Delaware), J. Deitzel, S. Sauerbrunn, J. W. Gillespie, Jr.*  

Glass transition and cold crystallization of the bulk and nanoconfined pharmaceutical nifedipine

*S. Cheng (Texas Tech University), G. McKenna*  

Super-hydrophobic membranes of poly(vinylidene fluoride) blended with specialized co-polymers for oil-water separation

*N. Govinna (Tufts University), P. Kaner, I. Sadeghi, D. Ceasar, A. Dhungana, C. Moers, K. Son, A. Asatekin, P. Cebe*  

Thermal properties of pentaerythritol benzoate and valerate

*A. Alrubayyi (Central Michigan University), B.A. Howell*
Tuesday, August 8, 2017

**Plenary Lecture**
Clayton Hall – Auditorium 128

8:00–8:10 Opening remarks

8:10–8:55 Functional nanoscale polymers: Macromolecule design and self-assembly for materials optimization
*T. Epps (University of Delaware)*

8:55–9:00 Break

**Honorary Session for Professor Wunderlich, In Memoriam & Polymers**
Room 120
Joseph Menczel, Retired (Session Chair)

9:00–9:40 Composition and sequence mandated topological effects on nano-scaled supralattices in precisely functionalized giant molecules
*Invited speaker: S. Cheng (University of Akron)*

9:40–10:00 Designed polymer crystallization for functional nanomaterials
*C. Li (Drexel University)*

10:00–10:40 Break

10:40–11:00 Testimonial
*J. Menczel and S. Cheng*

11:00–11:20 Understanding fiber spinning: The impact of fiber spinning
*M. Jaffe (New Jersey Institute of Technology)*

11:20–12:00 Crystal-to-crystal transitions in a semicrystalline polymer
*J. Menczel (Thermal Measurements LLC)*

12:00-13:30 Lunch
13:30-14:10  Tg at the nanoscale with flash DSC
Invited speaker: S. Simon (Texas Tech University)

14:10-14:30  Impact of molecular weight on the thermal stability and the miscibility of the poly(ε-caprolactone)/polystyrene binary blends
A. Mamun (Sultan Qaboos University), S. M. M. Rahman, S. Roland, R. Mahmood

14:30-14:50  DSC study of impact modifier blocking
L. Judovits (Arkema), M. Hu

14:50-15:30  Break

15:30-15:50  How thermal analysis can benefit nuclear energy sector
J. Grebowicz (University of Houston-Downtown (UHD))

15:50-16:10  NATAS Student Travel Award: Chain entropy and polymerization thermodynamics: Quantifying nanoconfinement effects
Q. Tian (Texas Tech University), H. Zhao, S. Simon

16:10-16:30  Structure and properties of super-hydrophobic membranes of poly(vinylidene fluoride) and poly(methyl methacrylate)-r-1H,1H,2H,2H-perfluorodecyl methacrylate for oil-water separation applications
N. Govinna (Tufts University), I. Sadeghi, D. Thomas, C. Schick, A. Asatekin, P. Cebe

16:30-16:50  Calorimetry of silk polymorphs
P. Cebe (Tufts University), B. Partlow, D. Kaplan, A. Wurm, E. Zhuravlev, C. Schick

16:50-17:10  Physical aging of pharmaceutical substances by advanced thermal analysis
M. Pyda (Rzeszow University of Technology), A. Czerniecka

17:10-17:30  Thermal analysis measurements on drawn fibers
J. Menczel (Thermal Measurements LLC)
**Thermal Hazards**

**Room 119**

Libby Glascoe, Lawrence Livermore National Lab  
Ben Yancey, Lawrence Livermore National Lab (Session Chairs)

9:00–9:20  
Prediction of the thermal ignition of hazardous materials from heat flow studies by using advanced kinetic analysis  
*B. Roduit (AKTS AG), M. Hartmann, P. Folly, A. Sarbach*  

9:20–9:40  
Thermal detrimental effects of different states of charge in lithium-ion battery module system–detonation of single 18650 cell  
*B. Laiwang, Y-C. Cheng, Y-H. Chung, Y-W. Wang, C-M. Shu (National Yunlin University of Science and Technology)*  

9:40–10:00  
Increased scrutiny for the chemical reactivity test (CRT) to determine the lifetime of thermally aged explosives  
*G. Guillen (Lawrence Livermore National Laboratory), E. Glascoe*  

10:00-10:40  
Break

10:40–11:00  
Thermal hazard assessment of reactive systems  
*L. Yang (Intertek)*

**Energetic Materials**

**Room 119**

Queenie Kwok, NRCan Canadian Explosives Research Laboratory  
Chi-Min Shu, National Yunlin University (Session Chairs)

11:00–11:40  
Issues with analysis of homemade explosives  
*Invited speaker: J. Oxley (University of Rhode Island), J. Smith*  

11:40–12:00  
On-going study on the thermal decomposition of nitrocellulose using pyrolysis-FTIR  
*Q. Kwok (NRCan Canadian Explosives Research Laboratory), R. Turcotte, S. Singh, M. Paquet*  

12:00-13:30  
Lunch
Cure kinetics of glycidyl azide polymer (GAP) with propargyl esters, bis-propargyl ether, and 4,4’-dicyanohepta-1,6-diyne, a possible energetic curing agent for azide polymers

J-C. St-Charles, M.E. Araya Marchena (École Polytechnique de Montréal), C. Dubois

Specific heat capacity measurement of pentaerythritol tetranitrate derivatives

H. Tian (Los Alamos National Laboratory), G. Brown

Mechanism research of thermal oxidation processes of red phosphorus based on kinetic approach

L. Jie (Nanjing University of Science and Technology), H. Guan

Kinetics
Room 119
Richard Lyon, Federal Aviation Administration (Session Chair)

Modern isoconversional kinetics
Invited speaker: S. Vyazovkin (University of Alabama-Birmingham)

Parameterization of thermal degradation models for polymeric materials containing condensed-phase reactive additives

Y. Ding (University of Maryland, College Park), S. Stoliarov

Prediction of shelf life of materials from forced degradation studies based on different analytical techniques by using advanced kinetic and statistical analysis

B. Roduit (AKTS AG), M. Hartmann, P. Folly, A. Sarbach, A. Dejeaifve, R. Dobson

Assessing the effects of process temperature on crystallization kinetics of polyphénylene sulfide utilizing differential scanning calorimetry (DSC)

J. Browne (TA Instruments), K. Mohomed

Reaction rates of solids at low conversion

R. E. Lyon (Federal Aviation Administration)
### Pharmaceuticals

**Auditorium 125**

**Wenwen Huang, Tufts University (Session Chair)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker(s)</th>
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<tbody>
<tr>
<td>9:00-9:20</td>
<td>Electrospun fibers of poly(L-lactic acid) containing lovastatin with potential applications in drug delivery</td>
<td>M. Pyda (Rzeszow University of Technology), Y. Zhu, P. Cebe</td>
</tr>
<tr>
<td>9:20-9:40</td>
<td>Understanding the de- and rehydration kinetics of a lattice type pharmaceutical hydrate via microcalorimetry</td>
<td>J. Brum (GlaxoSmithKline), P. Skrdla, R. Forcino</td>
</tr>
<tr>
<td>9:40-10:00</td>
<td>Stability modeling to predict bio-product shelf-life and evaluate impact of temperature excursions from the “cold chain”</td>
<td>D. Clenet (Sanofi-Pasteur)</td>
</tr>
<tr>
<td>10:00-10:40</td>
<td>Break</td>
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<tr>
<td>10:40-11:00</td>
<td>Solution spun protein-based polymer fibers for pharmaceutical and medical applications</td>
<td>X. Hu (Rowan University), D. Jao, X. Mou</td>
</tr>
<tr>
<td>11:00-11:20</td>
<td>Performing solubility measurements using thermogravimetry</td>
<td>Y. Adhia (TA instruments - Waters LLC), C. Potter</td>
</tr>
<tr>
<td>11:20-11:40</td>
<td>Microcalorimetry techniques for characterization of biopharmaceuticals</td>
<td>P. Vaitiekunas (TA Instruments)</td>
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### Biocalorimetry, Biomaterials, & Biopolymers

**Auditorium 125**

**Xiao Hu, Rowan University (Session Chair)**

<table>
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<tr>
<th>Time</th>
<th>Session</th>
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<tbody>
<tr>
<td>13:30-13:50</td>
<td>Soybean oil-based thermosetting resins with methacrylated aromatic monomers as bio-based reactive diluent</td>
<td>Y. Zhang (Washington State University &amp; Northeast Forestry University), Y. Li, Z. Gao, M. Kessler</td>
</tr>
<tr>
<td>13:50-14:10</td>
<td>Characterization of regenerated polysaccharides/silk based blended biomaterials using ionic liquids</td>
<td>D. Salas de la Cruz (Rutgers University), J. Stanton, X. Hu, A. Hadadi, Y. Xue</td>
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<tbody>
<tr>
<td>14:10-14:30</td>
<td>Silk-boron nitride composite materials</td>
<td>Y. Xue (Rowan University), X. Hu</td>
</tr>
<tr>
<td>14:30-14:50</td>
<td>Thermally reversible gels and polymer single crystals of a bio-based, biodegradable polymer analyzed via differential scanning calorimetry</td>
<td>C. Liu (University of Delaware), B. Sobieski, I. Noda, B. Chase, J. Rabolt</td>
</tr>
<tr>
<td>14:50-15:30</td>
<td>Break</td>
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<tr>
<td>15:30-15:50</td>
<td>Thermal stability of glycerol/adipic acid hyperbranched poly(ester)s</td>
<td>B.A. Howell (Central Michigan University), T. Zhang, P. Smith</td>
</tr>
<tr>
<td>15:50-16:10</td>
<td>Bio-relevant thermal analysis</td>
<td>M. Jaffe (New Jersey Institute of Technology)</td>
</tr>
<tr>
<td>16:10-16:30</td>
<td>Combinatorial approach to the design of protein-based biopolymers</td>
<td>W. Huang (Tufts University), A. Tarakanova, M. Buehler, D. Kaplan</td>
</tr>
<tr>
<td>16:30-16:50</td>
<td>Concurrent collection and post-drawing of individual electrospun nanofibers to enhance macromolecular alignment and mechanical properties</td>
<td>D. Brennan (Rowan University), V. Beachley</td>
</tr>
</tbody>
</table>

**Business Meeting**

Room 120

17:30-18:00
Wednesday, August 9, 2017

Plenary Lecture
Clayton Hall – Auditorium 128

8:00–8:10 Opening remarks

8:10–8:55 Ultrasonic methods for characterization of polymeric materials
I. Alig (Fraunhofer Institute - LBF), D. Lellinger, H. Oehler

Rheology & Viscoelasticity
Room 120
Leela Rakesh, Central Michigan University
Sara Reynaud, Arkema, Inc. (Session Chairs)

and

Thermosets
Room 120
Michael R. Kessler, Washington State University (Session Chair)

9:00–9:20 Study on non-newtonian fluid flowing in the anti-siphon equipment of CFR600 design
Y. Peng (China Institute of Atomic Energy)

9:20–9:40 Using rheology to formulate and characterize foods
P. Rolfe (Malvern Instruments)

9:40–10:00 Characterizing anisotropy in polymers and composites using dynamic mechanical analysis in multiple deformation modes
S. Cotts (TA Instruments)

10:00–10:40 Break
Hydrogels from mechanical gelation of flexible non-Brownian fibers suspension
*Invited speaker: A. Perazzo (Princeton University), J. K. Nunes, S. Guido, H. A. Stone*

Visualization of silica agglomerates breakdown in shear thickening fluids by rheology
*R. Tao (National Institute of Standards and Technology)*

Stochastic mesoscale modeling of transiently networked (viscoelastic) fluids
*L. P. Cook (University of Delaware), L. Zhou*

Lunch

Three rheological approaches to quantifying polymer branching
*T. Chen (TA Instruments - Waters LLC)*

**TAFDV Student Travel Award:** Activation, softness, and local structure in supercooled colloidal liquids
*X. Ma (University of Pennsylvania), Z. Davidson, T. Still, R. Ivancic, S. Schoenholz, D. Sussman, A. Liu, A. Yodh*

**TAFDV Student Travel Award:** Role of confinement and polymer-particle interaction on polymer capillary rise infiltration (CaRI) dynamics
*J. L. Hor (University of Pennsylvania)*

**NATAS Student Travel Award:** Effect of dissolution of magnesium alloy AZ31 on the rheological properties of phosphate buffer saline (PBS)
*U. Riaz (Central Michigan University), L. Rakesh, W. Haider, I. Shabib*

Break

Enhancing material characterization for the polymer industry
*J. Eickhoff (Anton Paar USA), A. Shetty*

Comparison of viscosity build to fluorescence probe wavelength shift for characterizing cure of epoxy resin
*L. Yang (Intertek)*
DMA testing of epoxy resins: The importance of dimensions
I. McAninch (US Army Research Laboratory - RDRL-WMM-G), G. Palmese, J. Lenhart, J. La Scala

TS-1

16:30-16:50
Vitrification in commercial filled thermosets
K. Schoch, J. Clifton, P. Panackal, L. Nusbaum

TS-2

Rheology of dilute polymer solution with and without nano-fillers using coarse grained simulation and modeling
L. Rakesh (Central Michigan University)

RV-13

Honorary Session on Lifetime Prediction, Joseph H. Flynn in Memoriam
Room 119
Chris White, NIST (Session Chair)

9:00-9:20
Joe Flynn remembered
R. Blaine (retired), C. Guttman

JHF-1

9:20-9:40
The deep glassy state: A paradigm challenging "unexplored" region
Invited speaker: G. McKenna (Texas Tech University), H. Yoon

JHF-2

9:40-10:00
Polyethylene aging in accelerated and outdoor environments.
C. White (NIST), L. Sung, D. Jacobs, J-H. Kim, L. Perry, C-Y. Lu, H-C. Hsueh

JHF-3

10:00-10:40
Break

10:40-11:00
Using thermal gravimetric analysis to quantify sorption and diffusion of moisture in polymeric and non-polymeric materials: Experimental methods and high fidelity modeling
E. Glascoe (Lawrence Livermore National Laboratory), Y. Sun, H. Sharma, S. Harley

JHF-4

11:00-11:20
Using thermal analysis to develop strategies for preparing epoxy clay hybrid (ECH) nanocomposite enhanced fiber-reinforced polymer (FRP) composites
G. Holmes (National Institute of Standards and Technology)

JHF-5

11:20-12:00
Practice for using thermogravimetric analysis on evaluating thermal endurance properties for polybutylene terephthalate (PBT)
H. Chiang (Underwriters Laboratories, Inc.), T. Fabian, D. Francke, L. Judovits

JHF-6
<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Speaker(s)</th>
<th>Room</th>
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<tbody>
<tr>
<td>13:30-14:10</td>
<td>Thermoresponsive particles to test the Kovacs signatures in glass-forming colloids</td>
<td>Invited speaker: G. McKenna (Texas Tech University), X. Peng, Q. Li, S. Banik</td>
<td>CS-1</td>
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<tr>
<td>14:10-14:30</td>
<td>Variations on limiting oxygen concentration under different scenarios of ethane and ethylene reaction system via 20-L-apparatus</td>
<td>J-R. Lin, S-C. Ho, T-H. Lin, C-M. Shu, J-R. Chen (Hsiuping University of Science and Technology (HUST))</td>
<td>CS-2</td>
</tr>
<tr>
<td>14:30-14:50</td>
<td>Fast thermoanalytical profiling of petrochemical samples by evolved gas analysis using photoionisation-MS and ultra-fast gas chromatography</td>
<td>R. Zimmermann (JMSC (Helmholtz Zentrum München/CMA and University of Rostock)), T. Streibel, S. Wohlfahrt, A. Ulbrich, C. Grimmer, A. Walte, S. Ehlert, T. Denner</td>
<td>CS-3</td>
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<tr>
<td>14:50-15:30</td>
<td>Break</td>
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<tr>
<td>15:30-15:50</td>
<td>Thermal stability of flame retardants derived from the biomolecules, isosorbide and castor oil</td>
<td>B. A. Howell (Central Michigan University), Y. Daniel, E. Ostrander</td>
<td>CS-4</td>
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<tr>
<td>15:50-16:10</td>
<td>Methodologies for the detection and quantification of heterogeneous defects in silicone networks</td>
<td>R. Maxwell (Lawrence Livermore National Laboratory), J. Rodriguez, J. Lewicki, J. Crowhurst, C. Fox</td>
<td>CS-5</td>
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<tr>
<td>16:10-16:30</td>
<td>Thermal degradation of platinum(II) endcapped glycerol/adipic acid hyperbranched poly(ester)s</td>
<td>U. Huynh (Central Michigan University), B. A. Howel</td>
<td>CS-6</td>
</tr>
<tr>
<td>16:30-16:50</td>
<td>Thermal degradation of phosphorus esters of methyl 3,5-dihydroxybenzoate</td>
<td>E. Ostrander (Central Michigan University), B.A. Howell</td>
<td>CS-7</td>
</tr>
<tr>
<td>16:50-17:10</td>
<td>Thermal diffusivity and composite decomposition</td>
<td>S. Sauerbrunn (University of Delaware - CCM)</td>
<td>CS-8</td>
</tr>
</tbody>
</table>
Inkjet-assisted nanocalorimetry for trace detection
F. Yi (NIST), J. Lawrence, T. Forbes, M. Staymates, J. G. Gillen, D. LaVan

Heat capacity spectroscopy at thermal and reaction-driven glass transition studied by stochastic temperature modulated calorimetry
F. Böhm, D. Lellinger, I. Alig (Fraunhofer Institute - LBF)

Investigation of the combustion characteristic temperatures of carbon pellets with different kinds of biochars
B. Li (Zhengzhou Tobacco Research Institute of CNCTC), J. Cai, K. Zhang, M. Zhang, D. Lu, N. Deng, W. Zhu, L. Wang

Heat of fusion of polymer crystals by fast scanning calorimetry
P. Cebe (Tufts University), D. Thomas, J. Merfeld, B. Partlow, D. Kaplan, R. G. Alamo, A. Wurm, E. Zhuravlev, C. Schick

Use of fast-scanning thermal methods to address industrially relevant challenges
K. Kearns (Dow Chemical)

Fast scanning calorimetry (FSC) of Se-In-Ag glassy alloy
D. Sharma (LC), A. Kumar, R. Shukla

Novel technique for quantitative fast scanning calorimetry on electrospun fibers
D. Thomas (Tufts University), N. Govinna, C. Schick, P. Cebe
### Instrumentation

**Auditorium 125**  
**Kdaine Mohomed, TA Instruments**  
**Eric Schoch, Northrop Grumman (Session Chairs)**

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<tr>
<th>Time</th>
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<tr>
<td>13:50-14:10</td>
<td>Thermal analysis coupled to ultra-high mass resolution FTICR mass spectrometry: Comprehensive molecular profiling in evolved gas analysis</td>
<td>R. Zimmermann (<em>JMSC (Helmholtz Zentrum München/CMA and University of Rostock)</em>), C. Rüger, A. Neumann, M. Sklorz, S. Ehlert</td>
</tr>
<tr>
<td>14:10-14:30</td>
<td>THEMYS: New innovative thermal analysis platform – capabilities and applications</td>
<td>R. Rahi (<em>SETARAM Inc.</em>), J. Mangler, Y. Cherisien</td>
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### Thermal Conductivity

**Auditorium 125**  
**Adam Harris, CTherm (Session Chair)**

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<tbody>
<tr>
<td>14:30-14:50</td>
<td>Theoretical, computational, and experimental validation of the modified transient plane source (MTPS) method</td>
<td>M. Emanuel, R. Bateman, S. Ackermann (<em>Thermal Analysis Labs</em>)</td>
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<tr>
<td>14:50-15:30</td>
<td>Break</td>
<td>-------------------------------------------------------------------------------------------------------</td>
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<tr>
<td>15:30-15:50</td>
<td>Status of reference materials and standards for thermal effusivity</td>
<td>R. Blaine (retired)</td>
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<td>15:50-16:10</td>
<td>Relationship between thermal conductivity and saturation conditions in soils interested by very shallow geothermal systems: An overview of ITER</td>
<td>E. Di Sipio (<em>Friedrich-Alexander University of Erlangen-Nuremberg</em>), D. Bertermann</td>
</tr>
<tr>
<td>16:10-16:30</td>
<td>Investigation of polymer thermal anisotropy through melt and recrystallization using the hot disk transient plane source (TPS) technique</td>
<td>M. Thomas (<em>Thermtest Inc.</em>), D. Hume, D. Cederkrantz, R. Dinwiddie</td>
</tr>
</tbody>
</table>
Determination of rocks thermal conductivity for shallow geothermal application: from laboratory scale to thematic maps generation for some Italian case studies

E. Di Sipio (Friedrich-Alexander University of Erlangen-Nuremberg), A. Galgaro, M. Cultrera, G. Dalla Santa

Characterization of the nucleation efficiency of carbon nanotubes for polymer crystallization

J.E.K. Schawe (Mettler-Toledo)

Note: This is a Fast Scanning Methods presentation

Food Science and Technology

Room 123

Neil Mukherjee, Mondelez International (Session Chair)

13:30-14:10

Thermal analyses reveal the role of biophysical features of edible plant-tissue in the physical quality and digestibility of food systems

Invited speaker: M. Martinez Martinez (Purdue University)

Characterization of moisture mobility and diffusion in tobacco materials during drying by the TG-NMR analysis

W. Zhu (Zhengzhou Tobacco Research Institute of CNTC), L. Han, L. Chen, B. Li

14:30-15:30 Break

15:30-16:10

Study on thermophysical properties of different kind’s tobacco

D. Lu (Zhengzhou Tobacco Research Institute of CNTC), Y. Ma, M. Zhang, L. Wang, K. Zhang, B. Li, C. Liu, X. Liu

Thermal analysis of microcapsules

Invited speaker: J. Oxley (Southwest Research Institute)

Investigation of polyol / water interactions in chewing gum using thermal analysis

C. Norton, C. Stamboulides, I. Mukherjee (Mondelez International)
Cocktails – Ballroom 101 A & B  
18:30 to 19:00

Banquet – Ballroom 101 A & B  
19:00 to 20:00

Awards – Ballroom 101 A & B  
20:00 to 21:00

DJ – Ballroom 101 A & B  
21:00 to 23:00
Thursday, August 10, 2017

METTLER Award in Thermal Analysis – Plenary Lecture sponsored by Mettler Toledo

Clayton Hall – Auditorium 125

8:10-8:20 Opening remarks

8:20-9:05 An overview of kinetic models for lithium ion batteries induced by thermal runaway reaction

*W-C. Chen, Y-W. Wang, C-M. Shu (National Yunlin University of Science and Technology)*

PL-4

SETARAM Student Lecture sponsored by Setaram

CLayton Hall – Auditorium 125

9:05-9:25 Combining the power of DSC and X-ray diffraction: Structural analysis of self-organized supramolecular assemblies

*B. Partridge (University of Pennsylvania), M. Peterca, D. Sahoo, H-J. Sun, P. Heiney, P. Leowanawat, X. Zeng, G. Ungar, V. Percec*

PL-5

Honorary Symposium on Composites, Richard Wool in Memoriam

Room 120

Joseph Deitzel, CCM

John LaScala US Army Research Laboratory (Session Chairs)

9:30 – 9:50 Richard Wool: Testimonials

*S. Sauerbrunn (University of Delaware - CCM)*

RW-1

Environmentally friendly high performance bio-derived polymers for DoD applications

*J. La Scala (Army Research Laboratory), G. Palmese, J. Stanzione, B. Harvey, G. Yandek, W. Eck, S. Kumar Yadav*

RW-2
10:10-10:30  Strategic assemblies of modified xylochemicals for new bio-based polymers

*J. Stanzione* (Rowan University)

10:30-11:00  Break

11:00-11:20  Bio-based composites from soybean oil and feather fibers for electronic applications

*Invited speaker: M. Zhan (W. R. Grace Co.-Conn), R. Wool*

11:20-11:40  Functionalization of pan-based carbon fiber for improved wetting and interfacial shear strength

*M. Kubota (University of Delaware), S. Sauerbrunn, J. Deitzel, J. W. Gillespie, Jr.*

11:40-12:00  Richard Wool: The expert witness

*S. Sauerbrunn (University of Delaware - CCM), K. Reno*

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**Chemical Stability, Polymer Degradation, & Flammability**

**Room 119**

**Janis Matison, Silar (Session Chair)**

9:30-9:50  Thermal stability of the bis-DOPO ester of N-phenyl-4,4-di(4-hydroxyphenyl)pentanamide

*H. Fulco (Central Michigan University), B.A. Howell*

9:50-10:10  Thermal stability of phosphonate and phosphate esters of 4,4’-bishydroxydeoxybenzoin

*G. Lienhart (Central Michigan University), B.A. Howell*

10:10-10:30  Thermal properties of oligomeric esters from phosphorus-containing butanediolic acids

*V. Hill (Central Michigan University), B.A. Howell*
Inorganic & Ceramic Materials / High Temperature Analysis
Room 119
Marc-Antoine Thermitus, NETZSCH
Yongsheng Zhang, North China Electric Power University (Session Chairs)

NATAS Student Travel Award: Volatilization of arsenic, mercury and other volatiles during biomass combustion
Y. Zhang (North China Electric Power University), W-P. Pan

Optimization of solution treatment parameters for aluminum alloy powders through the use of thermal analysis
C. Walde (WPI), D. Cote, R. Sisson, V. Champagne

General Session
Auditorium 125
Tara Fortin, National Institute of Standards and Technology (Session Chair)

9:30-9:50 Ultrapurification of monomers and other small organic molecules by zone melting
A. McGhie (LRSM, University of PA), G.J. Sloan

9:50-10:10 The world of oxidative analysis using pressure differential scanning calorimetry
T. Adams (The Lubrizol Corporation)

10:10-10:30 Thermophysical properties of polyl ester lubricants
T. Fortin (National Institute of Standards and Technology)

10:30-11:00 Break

11:00-11:20 Thermally-induced chemical transformations in short peptides
D. V. Soldatov (University of Guelph), F. I. Ali, A. J. Smith

11:20-11:40 Developing standards in ASTM international committee E37 on thermal properties
T. O'Toole (ASTM International)

11:40-12:00 TORC – A unique optical approach to thermal analysis
T. Husemann (Anton Paar GmbH), S. Schwarz, G. Henriques

End of Conference