

50th North American Thermal Analysis Society Conference and 8th Baekeland Symposium 2024

Knoxville, Tennessee, USA
16 - 19 September 2024

ISBN: 979-8-3313-0525-3

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571

Some format issues inherent in the e-media version may also appear in this print version.

This work is licensed under a Creative Commons Attribution 4.0 International License.
License details: <http://creativecommons.org/licenses/by/4.0/>.

No changes have been made to the content of these proceedings. There may be changes to pagination, and minor adjustments for aesthetics.

Printed with permission by Curran Associates, Inc. (2025)

For permission requests, please contact North American Thermal Analysis Society
at the address below.

North American Thermal Analysis Society
P.O. Box 4961
Louisville, KY 40204
USA

Phone: 502.456.1851 x1
Fax: 502.456.1821

info@natasinfo.com

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

1. CONFERENCE REPORT

Abstracts of the 2024 50th Annual NATAS Conference.....	1
<i>Rigoberto Advincula, Christopher Bowman, Dennis Smith, Karl Schoch Jr, Tina Adams, Cathy Stewart, Lawrence Judovits, Louis Pilato</i>	

2. PLENARY LECTURES

2.1. Mettler-Toledo Award Presentation: Aspects of the Calorimetric Characterization of Matter in the Non-Equilibrated State	1
<i>Jürgen E. K. Schawe</i>	
2.2. Net-Zero by 2050: Can We Get There?	2
<i>David Sholl</i>	
2.3. Cool Plastics for a Greener World	2
<i>Natalie Stingelin</i>	

3. SESSION: PAST RECIPIENTS OF THE METTLER-TOLEDO AWARD

3.1. My Journey with Thermal Analysis.....	3
<i>R. Bruce Prime</i>	
3.2. Accidental Discoveries/Innovations/Business Growth via Thermal Analysis & Rheology.....	3
<i>Yash Khanna</i>	
3.3. Composites, Rubber, Glasses and DNA: 50+ Years of Interrogating Materials Physics with Thermal Analysis and Rheology.....	4
<i>Gregory McKenna</i>	
3.4. A Life in Thermal Analysis: the Rigid Amorphous Phase, the Cooling Calibration of DSCs, Polymeric Fibers and the Crystal-to-Crystal Transitions.....	5
<i>Joseph Menczel</i>	
3.5. Sixty Years of Thermal Analysis and Counting	5
<i>Andrew McGhie</i>	
3.6. Milestones with Thermal Analysis: Mode of Degradation for Vinylidene Chloride Barrier Polymers and Poly(Styrene)	5
<i>Bob A. Howell</i>	
3.7. Thermal Properties of Silk Fibroin Protein.....	6
<i>Peggy Cebe</i>	
3.8. Tg and Structural Recovery by Flash DSC.....	6
<i>Sindee Simon</i>	
3.9. Defining Starch Materials: Structure and Properties	6
<i>Janis Matisons</i>	

3.10. TA Today the Impact of Thermal Analysis for the Characterization of Bioderived and Bioinspired Polymeric Materials Sustainable Materials, Materials for Use In Vivo	7
<i>Michael Jaffe</i>	

4. SESSION: ENERGETIC MATERIALS AND THERMAL HAZARDS

4.1. Novel Screening Method for Explosive Hazard Identification in Pharmaceutical Process Development	7
<i>Han Xia</i>	
4.2. Penetration Depth Test Study of Pellet to Cladding Interaction in Fast Reactor Design	8
<i>Yan Peng</i>	
4.3. An Improved Chemical Kinetic Model for TATB Decomposition	8
<i>Alan Burnham, Jason Moore, Batikan Koroglu, Keith Morrison, Keith Coffee, Greg Klunder, Adele Panasci-Nott, Ana Racoveanu, John Reynolds</i>	
4.4. Influence of the Temperature and Size on the Safety Conditions for Reactions in Big Volumes	9
<i>Elena Moukhina</i>	
4.5. Heat Flow Calorimetry on High Explosives at Low Temperatures	10
<i>John Rosener, Cody Cockreham, Elizabeth Glascoe, Steven Hawks</i>	
4.6. Thermoanalytical Studies on the Reactions of Magnesium and Lithium Powders with Oxygen and Carbon Dioxide.....	10
<i>Sergio Cordova, Kevin Estala-Rodriguez, Evgeny Shafirovich</i>	
4.7. A Safe Approach to Explosive Material Processing with LabRAM Technology.....	11
<i>Ginger Guillen</i>	
4.8. New Kinetic Approach for Evaluation of Thermal Hazard Indicators Based on DSC and ARC Data	12
<i>Bertrand Roduit , Patrick Folly, Alexandre Sarbach, Richard Baltensperger</i>	
4.9. Exothermic Decomposition Energy and Temperature—Proposal for Measurement Standardization in the United Nations Manual of Tests and Criteria.....	13
<i>Shanti Singh, Barbara Acheson, Garrison Condran, Sam Maach</i>	
4.10. Thermal-Treated IrOx Electrodes with Boosted Efficiency and Durability for Green Hydrogen Production	13
<i>Jun Li, Feng-Yuan Zhang, Weitian Wang, Lei Ding, David Cullen</i>	
4.11. Boosting the Energy Conversion Efficiency of Power-to-Hydrogen via Developing a Novel Porous Transport Material.....	14
<i>Weitian Wang, Jun Li, Lei Ding, Christopher Capuano, Nel Hydrogen, Kathy Ayers, Nel Hydrogen, Feng-Yuan Zhang</i>	
4.12. Estimating the Post-Exotherm Pressure Generation from Heated High Explosives within a Sealed Vessel	14
<i>Steven Hawks, Maxwell Lynch</i>	
4.13. Polymer Property Impacts on Processing Propellant Composites	15
<i>Alexandra Dobbs, Blair Brettmann</i>	

4.14. Evaluation of DMA Data of HMX Based Explosive Formulation and of Its HTPB-IPDI Binder Alone.....	15
<i>Manfred Bohn, Peter Gerber, Michael Herrmann</i>	
4.15. Peculiarities in Assessing Chemical Inter-Substance Reactions of Energetic Materials.....	16
<i>Manfred Bohn</i>	

5. SESSION: COMPOSITES AND NANOCOMPOSITES

5.1. Spinning a Greener Future: Biodegradable Silk Composite Fibers via Silkworm Diet Modification	16
<i>Xiao Hu, Melinda Deng</i>	
5.2. The Impact of Ultrasound Sonication on Chitosan-Silk Fibroin Composite Films	17
<i>Nagi Reddy Poluri, Xiao Hu</i>	
5.3. Multi-Scale Structure Regulation of Ceramizable Phenolic Aerogel Composites to Achieve Super Thermal Insulation and Extreme Thermal Protection	17
<i>Yiming Yang</i>	
5.4. Enhancement of Rate of Crystallization of Thermoplastic Polymers by Carbon Nanoparticles	18
<i>Joseph Menczel</i>	
5.5. Adhesion-Diffusional-Based Corrosion Protection Mechanisms of Polyaniline-Primed Fluoropolymer Coatings	18
<i>Mark Rigel Ali, Szeemaine Tigno, Jackson Honeyman, Eugene Caldona</i>	
5.6. Advanced Poly(Naphthalene) Networks from BODA-Derived Resins: Building Blocks for High-Temperature Thermosetting Polymers, Composites, and High Yielding Carbon Precursor.....	19
<i>Ernesto Borrego, Dennis Smith, Niroshani Abeynayake, William Johnson</i>	
5.7. Recyclable Thermoset Resin and Composites via Tailored Vitrimers Chemistry	19
<i>Mary Danielson, Menisha Korallalage, Tomonori Saito, Anisur Rahman</i>	
5.8. 3D-Printing of Partially Bio-Based Methacrylate Resin Composites with Surface Functionalized Carbon Fibers.....	20
<i>Karen Cortes-Guzman, Zoriana Demchuk, Tomonori Saito, Rigoberto Advincula</i>	
5.9. Enhanced Energy Storage with 3D-Printed Bimetallic Metal-Organic Frameworks and Reduced Graphene Oxide Hybrid Nanocomposite.....	20
<i>Mahshid Mokhtarnejad, Soheil Almasi, Mariana Milano-Benitez, Bamin Khomami</i>	
5.10. AI and Biomimetic Assembly for Soft Hybrid Materials and Energy Storage	21
<i>Jihua Chen</i>	
5.11. Effect of Silica Particle Functionalization on the Bulk Viscoelastic Properties of Covalent Adaptable Network Composites	21
<i>Jaehyun Cho, Blair Brettmann, M.G. Finn</i>	

6. SESSION: SUSTAINABLE POLYMERS

6.1. Novel Reprocessable Cross-Linked Polymer Networks: Importance of Rheology and Thermophysical Property Characterization in Advancing Sustainability, Recycling, and Upcycling.....	22
<i>John Torkelson</i>	

6.2. Upcycling PET Waste into Vitrimers with Exceptionally Tough Adhesion.....	22
<i>Mary Danielson, Tomonori Saito, Anisur Rahman</i>	
6.3. Crystallization Kinetics of Blends of Sustainable Aliphatic Polyesters Derived from 1,18 Octadecanedioic Acid and Diols with Dissimilar Length.....	23
<i>Briona Carswell, Rufina G Alamo</i>	
6.4. Upcycling of Waste Plastic into New Materials via Multiple Olefin Metathesis	23
<i>Jeff Foster, Joshua Damron, Chao Guan, Ilja Popovs, Anisur Rahman, Nick Galan, Tomonori Saito, Isaiah Dishner, Jackie Zheng</i>	
6.5. Selective Deconstruction and Upcycling of Step-Growth Polymers	24
<i>Tomonori Saito, Nick Galan, Anisur Rahman, Ke Cao, Zoriana Demchuk, Jeff Foster, Bobby Sumpter, Jackie Zheng, Md. Arifuzzaman</i>	
6.6. Catalytic Mechanopolymerization for the Synthesis of Sustainable Polymers.....	25
<i>Toby Nelson, Mohammad Ebqa' ai</i>	
6.7. 3D Printing Fully Recyclable, Self-Healing Vitriimer from 100% Sustainable Sources	25
<i>Sargun Singh Rohewal, Logan Kearney, Amit Naskar</i>	
6.8. Biopolymer and Polymer Synthesis with Biocatalysts	25
<i>Yue Yuan</i>	
6.9. Advancing Sustainability and the Circular Economy through Advanced Molecular-Level Recycling of Automotive Plastics.....	26
<i>Mahshid Mokhtarnejad, Gary Hawkins, Hendrik Mainka</i>	

7. SESSION: RHEOLOGY

7.1. Elongational Viscosity of Large Cyclic Macromolecules.....	27
<i>Gregory McKenna, Dongjie Chen, Julia Kornfield, Hojin Kim, Zhiyuan Qian, Judit Puskas, Gabor Kaszas, Kristof Molnar</i>	
7.2. Non-Linear Mechanics of Foams under Tensile, Compressive, and Shear Deformations: Importance for Design of Helmet Padding.....	28
<i>Shuang Jin, Gregory McKenna, Linh Pham, Felipe Santos, Hossein Bahreinizad, Sudeesh Subramanian, Suman Chowdhury</i>	
7.3. Spatial Heterogeneity in Block Co-Polymers and Its Impact on Dynamics	28
<i>Bret Tantorino, Lori Hoover, Gregory McKenna</i>	
7.4. Rheometric Advances to Overcome Challenges Associated with Characterizing Pressure Sensitive Adhesives (PSA's).....	29
<i>Abhishek Shetty, Gunther Arnold, Jose Alberto Rodriguez Agudo, Andre Braun</i>	
7.5. Designing Polymer-Ceramic Suspensions for Extrusion-Based Additive Manufacturing: Effects of Non-Adsorbing Polymer Addition on Shear Rheology	30
<i>Ria Corder, Arezoo Ardekani, Jeffrey Youngblood, Kendra Erk</i>	
7.6. Rheological Considerations for Material Design and Selection of Print Parameters for Thermoset Additive Manufacturing.....	30
<i>Madeline Wimmer, Brett Compton</i>	

7.7. Characterizing Gelation of Thermally Cured Thermoset Composites for Additive Manufacturing and Semiconductor Packaging.....	31
<i>Stian Romberg, Paul Roberts, Polette Centella, Christopher Soles, Chad Snyder, Jonathan Seppala, Anthony Kotula, Sarah Lehrman</i>	
7.8. Rheological Analysis of Recycled Feedstock Materials for Large Format Additive Manufacturing	31
<i>Roo Walker, Ally Collier, Chad Duty, Matthew Korey, Amber M. Hubbard, Soydan Ozcan</i>	
7.9. Role of Glass Fiber on the Flow-Induced Crystallization of Poly(Ether Ether Ketone).....	32
<i>Xiaoshi Zhang, Alicyn Rhoades, Jason Alexander, Jiho Seo, Benson Jacob, Ralph Colby, Gijis Kort, Richard Schaake</i>	
7.10. Measuring Liquid Crystallinity by Thermomechanical Analysis of Shape Memory Epoxy	33
<i>Collin Pekol</i>	

8. SESSION: MODELING & SIMULATION

8.1. Introducing Molecular Topology in Polymer Informatics	33
<i>Konstantinos Vogiatzis</i>	
8.2. Remote Monitoring of Vitamin Degradation in Food and Pharmaceutical Products.....	34
<i>Bertrand Roduit, Damiano Rickenbach, Patrick Folly, Lexandre Sarbach, Richard Baltensperger</i>	
8.3. Thermal Hazards Assessment of Three Azo Nitrile Compounds Using AKTS	34
<i>Dylan Aljovic, Cuixian Yang, Thomas Vickery, Megan Roth, Daniel Muzzio</i>	
8.4. Understanding the Performance of Holographic Photopolymers Using Thiol-Ene Chemistry via Numerical Simulations	35
<i>Yunfeng Hu, Christopher Bowman</i>	
8.5. Exploring Machine Learning Models to Predict SAM Number and Compressive Strength of Optimized Aggregate Graded Structural Concrete Mixes	35
<i>Sazzadul Saykat, Debalina Ghosh, Ammar Elhassan, Saeed Davar, John Ma</i>	

9. SESSION: 3D PRINTING/ADDITIVE MANUFACTURING

9.1. 3D Printing for Smart/Advanced Applications.....	36
<i>Jose Bonilla-Cruz</i>	
9.2. 3D-Printed Polymeric Membranes for Water Purification and Carbon Capture Applications.....	36
<i>Eugene Caldon, Dianne Gutierrez, Lucas Kilpatrick, Rigoberto Advincula</i>	
9.3. Designing for Thermoforming Process via Thermomechanical Characterization	36
<i>Segun Talabi, Tyler Smith, Brittany Rodriguez, Ryan Ogle, Julian Charron, Sana Elyas, David Nuttall, Vlastimil Kunc, Vipin Kumar, Ahmed Hassen</i>	
9.4. 3D Printing of Low to Medium Solid Loaded Epoxy Micro-Composite Inks: Characterizing and Improving Printability for Tunable Material Properties.....	37
<i>Zane Smith</i>	
9.5. Considerations for Large-Format Additive Manufacturing of Bio-Based Feedstocks in Natural Environments: Polymer Degradation, Aging, and Weathering	37
<i>Caitlyn Clarkson, Amber M. Hubbard, Katie Copenhagen, Halil Tekinalp, Soydan Ozcan</i>	

9.6. Comprehensive and Multidimensional First-Principles Kinetic Modeling of Free-Radical Photopolymerization for Additive Manufacturing	38
<i>Christopher Bowman</i>	
9.7. Additive Manufacturing of Polymers with Closed-Loop Circularity	39
<i>Tomonori Saito, Karen Cortes-Guzman, Mary Danielson, Anisur Rahman, Zoriana Demchuk, Jeff Foster, Sungjin Kim</i>	
9.8. AI/ML in Polymers and Additive Manufacturing	39
<i>Rigoberto Advincula</i>	

10. SESSION: THERMOPHYSICAL PROPERTIES

10.1. Revisiting the Al-Fe-Si Liquidus Surface for Designing the Next-Generation of Impurity-Tolerant Aluminium Alloys	39
<i>Paul Lafaye, Jean-Philippe Harvey, Vincent Rioux-Frenette</i>	
10.2. Investigating the Influence of Hydrated Aluminum Powder on Metal Oxidation Reaction Correlated with Heating Rate	40
<i>Mahmuda Ishrat Malek, Michelle Pantoya</i>	
10.3. Thermophysical Properties of Lunar Regolith Simulant LHS-1 and Ice Sublimation Kinetics in Its Mixtures with Frozen Water	40
<i>Evgeny Shafirovich, Dominic Austen</i>	
10.4. Thermal Properties of Diglucoses.....	41
<i>Asya Bakhtina</i>	
10.5. A Tale of Two Step-Growth Cyclopolymerizations. Synthetic Approaches to Semi-Fluorinated Polyaryl Ethers and Carbon Precursor Resins	41
<i>Dennis Smith, Gustavo Munoz, William Johnson, Kari Chamberlain, Charles Pittman, Ernesto Borrego</i>	
10.6. Thermal Degradation of a Novel Series of Polyampholytes.....	42
<i>Anuja Jayasekara, Ryo Shimada, Ayse Asatekin, Luca Mazzaferro, John Thomas, Peggy Cebe, Meghan Luebehusen, Gigi Zheng, Coco Xu, Nathaniel van Gennip</i>	
10.7. Synthesis and Thermal Studies of High Performance 6F and 12F Polymers	43
<i>Gustavo Munoz, Maxim E. Solovyev, Kari Chamberlain, Charles Pittman, Dennis Smith</i>	
10.8. Comprehending the Structure of Ultrathin Polyzwitterionic Surfaces for Anti-fouling	43
<i>Charini Maladeniya, Panagiotis Christakopoulos, Ilia Ivanov, Liam Collins, Marti Nualart, Benjamin Doughty, Sun Pan, Marea Blake, Scott Retterer, Rajeev Kumar, Rigoberto Advincula</i>	
10.9. Soybean Extract as a Promising Additive for Enhancing Surface Adhesion and Corrosion Protection of Fluoropolymer Coatings	44
<i>Marcel Roy Domalanta, Delas Armas Emerson, Caldona, Sanjida Ferdousi, Yijie Jiang</i>	
10.10. In-Situ Dielectric Analysis of Thermoplastic Polymers: Unveiling Thermal and Structural Dynamics.....	44
<i>Alec Redmann, Nicholas Ecke, Alexander Chaloupka, Natalie Rudolph</i>	

11. SESSION: KINETICS

11.1. Nucleation of Poly(pentylene adipate-co-terephthalate) Crystals with Various Ionomers.....	45
<i>Brian Grady, Hesham Aboukeila, John Klier, Emily Edwards, George Huber</i>	
11.2. Cure-Kinetics Study for New Advanced Curing Structural Adhesives.....	45
<i>Lang Wei</i>	
11.3. Updating Critical Temperature Calculations of Several Secondary High Explosives	45
<i>Jason Moore, Steven Hawks</i>	
11.4. Effects of Mass Transport on Thermal Decomposition Kinetics	46
<i>Alan Burnham, Chiara Saggese, Batikan Koroglu</i>	
11.5. Kinetics and TTT diagram for Curing of Epoxy-Amine System.....	46
<i>Elena Moukhina, Claire Strasser</i>	
11.6. Insights into Cure and Cure Kinetics from Simulated DSC Curves	47
<i>Bruce Prime</i>	
11.7. Kinetic Analysis of Thermoset Precursor-Derived Carbon Catalyzed by Organometallic Compounds.....	48
<i>Faheem Muhammed, Ngon Tran, Daniel B. Knorr</i>	
11.8. Kinetics of Plasticized Poly(Vinyl Chloride) Thermal Degradation. Induction, Autocatalysis, Glass Transition, Diffusion.....	48
<i>Vadim Krongauz</i>	
11.9. Application of the Master Kinetics Approach for the Prediction of the Thermal Behavior of the Propellants Belonging to the Same Class of Materials	49
<i>Bertrand Roduit, Damiano Rickenbach, Patrick Folly, Alexandre Sarbach, Marc Leubin, Fabian Stucki, Richard Baltensperger</i>	
11.10. Isothermal Crystallization and Time-Temperature-Transformation of Amorphous Indomethacin and Its Co-Amorphs.....	50
<i>Elaheh A. T. Moghadam, Sindee Simon</i>	

12. SESSION: MEMORIAL SESSION FOR PROF. BERNHARD WUNDERLICH

12.1. Comparison of PVDF Resins Made Using Different Surfactants.....	50
<i>Larry Judovits</i>	
12.2. Liquid Heat Capacity of Amorphous Poly(Lactic Acid).....	50
<i>Marek Pyda, Marcin Skotnicki, Anna Czerniecka</i>	
12.3. Cooling Calibration Aspects of Differential Scanning Calorimeters	51
<i>Joseph Menczel</i>	
12.4. Understanding Polymer Behavior: The Wunderlich Message	51
<i>Michael Jaffe</i>	

13. SESSION: ADVANCED INSTRUMENTATION & TANDEM TECHNIQUES

13.1. Advantages of a Single Cell DSC Operated in Power Compensation Mode	52
<i>Danielle Kimmel, Matthias Wagner</i>	
13.2. Insights into Food Processing Physics and Chemistry with Thermal Analysis and Microscopy	52
<i>Danielle Kimmel, Matthias Wagner, Markus Schubnell</i>	
13.3. Monitoring Curing Using QiDSC and Pycnometry	53
<i>Larry Judovits</i>	
13.4. Using Thermal Analysis in Elastomer Compatibility Studies	53
<i>Tina Adams</i>	
13.5. Enhanced Characterization of Polymers and Composite Materials Utilizing Axial-Torsional Dynamic Mechanical Analysis	54
<i>Gunther Arnold, Jose Alberto Rodriguez Agudo, Jan Haeberle, Christopher Giehl, Jörg Läuger, Abhishek Shetty</i>	
13.6. Temperature Dependent Structural Transitions in Highly Oriented Nylons with Symmetric Alkane Segments.....	55
<i>Logan Kearney, Michael Toomey, Amit Naskar</i>	
13.7. Simplifying the Identification of DSC Curves	55
<i>Yanxi Zhang</i>	

14. SESSION: FAST SCAN TECHNIQUES/NANOCALORIMETRY

14.1. Influence of Molecular Structure on the Cooperative Fluctuation in the Vicinity of the Glass Transition.....	55
<i>Jürgen Schawe, Allisson Saiter, Kylian Hallavant, Antonella Esposito</i>	
14.2. Reproducible Cycling of Phase-Change Material via Nanocalorimetry	56
<i>Jie Zhao, Zichao Ye, Leslie Allen, Chih-Yu Lee, Carlos A. Ríos Ocampo, Ichiro Takeuchi, Mikhail Y. Efremov</i>	
14.3. Crystallization Kinetics and Polymorphism in PA66/6I6T Blends: Influence of Chain Mobility and Temperature	57
<i>Xiaoshi Zhang, Alicyn Rhoades, Ping Yi Leslie Poh, John Buzinkai</i>	
14.4. A Novel and Robust Method for Automated Heat Capacity Analysis of Polymeric Calorimetric Data	57
<i>John Thomas, Peggy Cebe</i>	
14.5. The Crystallization and Rigid Fraction of PLLA	58
<i>Logan Williams, Sindee Simon</i>	
14.6. Investigation of Commercial Isotactic Polypropylene Fibers Using Conventional DSC and Flash DSC	58
<i>Yung P. Koh, Sindee Simon</i>	
14.7. FSC-Empowered Multi-Technique Analysis of the Crystallization Kinetics and Resulting Microstructure in Engineering Thermoplastics	58
<i>Alicyn Rhoades, Xiaoshi Zhang, John Buzinkai</i>	

15. SESSION: ELECTRONIC PACKAGING MATERIALS

15.1. Thermal Analysis of Materials Used in Microelectronics	59
<i>Karl F. Schoch Jr.</i>	
15.2. Prediction of Thermal Stability of Epoxy Resin by Modified Kinetic and Model Selection Approaches Based on Limited Amount of Experimental Points	59
<i>Bertrand Roduit, Patrick Folly, Alexandre Sarbach, Richard Baltensperger</i>	
15.3. Correlation of Underfill Materials Thermo-Mechanical Behavior with Advanced Packaging Stress and Reliability	60
<i>Kaysar Rahim</i>	
15.4. Measurement and Prediction of Cure Kinetics, Gel Point, and Cure Stress of Underfill	61
<i>Ran Tao, Stian Romberg, Amanda Forster</i>	
15.5. Thermal and Mechanical Characterization of Potting Materials for Electric Vehicle Applications.....	61
<i>Arya Hakimian</i>	
15.6. Analysis of High Thermal Conductivity Liquid Dispensed Silicone Gap Fillers for Use in Manufacturing	62
<i>Adam Karges, Craig Whitehead</i>	

16. SESSION: POSTERS

16.1. Application and Development on Multi-Samples Thermal Analysis in Tobacco Pyrolysis and Combustion Process	62
<i>Bin Li, Lili Fu, Yue Zhang, Zhongya Guo</i>	
16.2. Application of Thermal Analysis to Evaluate Thermal State of Tobacco Materials in Heated Tobacco Products.....	63
<i>Lili Fu, Bin Li, Ke Zhang, Le Wang, Chunping Wang, Qi Zhang, Wenkui Zhu</i>	
16.3. Tough and Recyclable Glass Fiber Composites with Tailored Dynamic Chemistry	63
<i>Menisha Koralalage, Anisur Rahman, Tomonori Saito</i>	
16.4. Electrospinning of Non-Woven Fibrous Filtration Membranes from PVDF/Polyampholyte Blends.....	64
<i>Anuja Jayasekara, Peggy Cebe, Ayse Asatekin, Luca Mazzaferro, Ryan O'Hara</i>	
16.5. Site Specific Thermomechanical Analysis of Large Format Printed Polymer Composite Structures.....	64
<i>Benjamin Blume, Tyler Corum, Chad Duty, Vipin Kumar, Ahmed Hassen</i>	
16.6. Fast Scanning Calorimetry Study of Confinement Dynamics in Polyzwitterions Containing Molar Ratios of Salt.....	65
<i>John Thomas, Sophia Dinn, Ashleigh Herrera, Ayse Asatekin, Peggy Cebe</i>	
16.7. Interlayer Bonding in Hybrid Material Fused Filament Fabrication Processes	65
<i>Micah Vranes, Philip Barnett</i>	
16.8. Nylon 6 Deconstruction and Upcycling: From Waste to a New Place	66
<i>Jackie Zheng, Mairead Boucher, Nick Galan, Jeff Foster, Tomonori Saito, Md Arifuzzaman</i>	

16.9. Elucidating the Role of Ionic Liquids on the Deconstruction of Step-Growth Polymers	66
<i>Nick Galan, Christine Rukeyser, Subhamay Pramanik, Bobby Sumpter, Jeff Foster, Tomonori Saito, Jackie Zheng</i>	
16.10. 3D-Printing Formulated Polyelectrolyte Complexes (PECs) in Air via Direct Ink Writing	67
<i>Anh Nguyen, Alicja Jurago, Rigoberto Advincula, Charles Patten</i>	
16.11. Enhancing Anti-Corrosion Properties of PANI- via Electrodeposited Composite Films with GO and PVK Additives	67
<i>Zachary Watson, Evelyn Winn, Karen Yanith Patiño Jaimes, Rigoberto Advincula, Ellis Kim</i>	
16.12. Thermal, Mechanical, and Unusual Crystallization Properties of Sustainable Aliphatic Polyesters Derived from 1,18 Octadecanedioic Acid and α - ω Diol Congeners from 2 to 18 CH ₂	68
<i>Rufina G. Alamo, Nickolas Boyd, Clay Kramer, Hamed Janani</i>	
16.13. Thermomechanical Properties of Sequence-Defined Polyamides	69
<i>Isaiah Dishner, Jeff Foster</i>	
16.14. Application of Data Loggers, Heat Balance and Kinetic Analysis of HFC, DSC or ARC Data for Evaluation of Safety Parameters of Energetic Materials. Remote Monitoring of the Remaining Shelf-Life	69
<i>Bertrand Roduit, Damiano Rickenbach, Patrick Folly, Alexandre Sarbach, Richard Baltensperger</i>	
16.15. Eco-Friendly Water-Based Conducting Ink Using Cellulose and Polyaniline for Printable Electronics	70
<i>Karen Yanith Patiño Jaimes, Alexandra Perez, Rigoberto Advincula, Karl Albright Tiston</i>	
16.16. Crystallization and Rigid Fraction of PLLA.....	71
<i>Logan Williams, Sindee Simon</i>	
16.17. Color Additive Effects on the Rheological Properties of Recycled LFAM Materials	71
<i>Ally Collier, Roo Walker, Nina Bhat, Chad Duty, Dylan Hoskins, Kyle Rowe</i>	
16.18. The Glass Transition and TTT Diagram in Indomethacin/Sucrose Benzoate Co-Amorphous Drug Delivery Systems.....	72
<i>Elaheh A. T. Moghadam, Sindee Simon</i>	
16.19. Thermophysical Properties of p-Quaterphenyl.....	73
<i>Andrew McGhie, Steven J. Szewczyk</i>	
16.20. Polymers as Electrolytes for Lithium Batteries	73
<i>Isaac Sutton</i>	
16.21. Characterization of Evolving Semi-Crystalline Carbon Structures from Bis-Ortho-Diynylarene (BODA) Homo- and Co-Polymer Networks.....	74
<i>William Johnson, Patrick Madden, Joshua Brown, Charles Pittman, Dennis Smith, Ernesto Borrego</i>	
16.22. Laser Synthesized High-Performance MnOx/rGO Hybrid Nanocomposite for Energy Storage Applications.....	74
<i>Mahhsid Mokhtarnejad, Soheil Almasi, Mariana Milano-Benitez, Bamin Khomami</i>	
16.23. Controlling Interphase Morphology in Thermoplastic Carbon Fiber Composite Manufacturing	74
<i>Kendra Allen, Logan Kearney, Amit Naskar, Jong Keum, Hicham Ghossein</i>	

16.24. Correlating Local Structural and Dielectric Heterogeneity with Charge Separation in Polymer Semiconductors.....	75
<i>Henry Kantrow, Natalie Stingelin, Claire Welton, Neethu Thomas, Manjunatha Reddy, Carlos Silva</i>	
16.25. Probing the Effect of Phase Morphology on Electrochemical Doping in a Conjugated Hairy-Rod Polymer.....	75
<i>Jude Kpare, Natalie Stingelin, Henry Kantrow</i>	
16.26. Unraveling the Physical Chemistry of Polyolefin-Cellulose Interfaces	76
<i>Hsiang-Ju Kai, Natalie Stingelin, Thomas Gartner</i>	
16.27. The Effects of Layer Height on a 3D Printed PLA/TPU/ABS Multi-Material Weld Interface for Simplification of Hybrid Polymer Manufacturing	76
<i>David Dabkowski, Avery Blau, Samantha Sedillo, Andrew Tchiblakian, Rigoberto Advincula</i>	
16.28. Detection of Changes in Crystallinity of 3D Printed PLA Using Broadband Dielectric Spectroscopy	77
<i>James Lambert, Rigoberto Advincula, Yangyang Wang</i>	
16.29. Improving Thermomechanical Properties of DLP 3D-Printed Composites, Using Phosphate Functionalized Graphene at Ultralow Loadings	77
<i>Jose Bonilla-Cruz</i>	
16.30. Upcycling of Multi-Layered Plastics Through Delamination.....	78
<i>Matteo Palesati, Mark Weber, Naomi Deneke, Blair Brettmann, Natalie Stingelin</i>	
16.31. Multivariate Approach to Predict Thermal Degradation in Wire and Cable Insulation	78
<i>Amy Kurr, David Harper</i>	
16.32. Kinetic Study of Pyrolysis of Tobacco Particles of Different Sizes Based on the Distributed Activation Energy Model	78
<i>Wen Kui Zhu, Gaofei Guo, Ke Zhang, Duoduo Huang, Bin Li</i>	
16.33. Electrophoretically Deposited TiO ₂ -Containing Pectin Smart and Corrosion-Resistant Composite Coatings.....	79
<i>Marcel Roy Domalanta, Mark Rigel Ali, Eugene Caldon</i>	
16.34. Super-Nonwetable and Superoleophilic Fluoropolymer-Modified Electrodeposited Polythiophene Coatings for Corrosion Protection	79
<i>Mark Rigel Ali, Jackson Honeyman, Marcel Roy Domalanta, Eugene Caldon</i>	
16.35. The Use of Thermal Analysis and Calorimetry for the Design and Production of Thermite-Based Heaters for Plug and Abandonment in Oil and Gas	80
<i>Andre Levchenko, Paul Carragher, Arild Stein</i>	

Author Index