

38th Annual Conference of the North American Thermal Analysis Society 2010

Philadelphia, Pennsylvania, USA
15-18 August 2010

ISBN: 978-1-5108-1030-3

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.

Copyright© (2010) by the North American Thermal Analysis Society
All rights reserved.

Printed by Curran Associates, Inc. (2015)

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

North American Thermal Analysis Society
2413 Nashville Rd., C2
Bowling Green, KY 42101

Phone: (270) 745-2530

Fax: (270) 745-2221

natas@wku.edu

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

DETECTION OF OBSCURED GLASS TRANSITIONS BY QIDSC	1
<i>L. Judovits, R. Gupta</i>	
THE SEARCH FOR KINETIC REFERENCE MATERIALS	9
<i>Roger Blaine</i>	
APPLICATION OF TA-MS COMBINED WITH PULSETA FOR CHARACTERIZATION OF MATERIALS	20
<i>Yu Huimei, Qi Lingjun, Zhang Qinghong, Jiang Danyu, Lu Changwei</i>	
NON-ISOTHERMAL KINETICS OF THE CRYSTALLINE TO SMECTIC A TRANSITION OF THE ALIGNED OCTYLCYANOBIPHENYL LIQUID CRYSTAL	28
<i>D. Sharma</i>	
THE METHODOLOGY OF INTERPRETING THERMAL ANALYSIS OF POLYMERS	39
<i>Bernhard Wunderlich</i>	
DO BIOPOLYMERS BEHAVE THE SAME AS SYNTHETIC HIGH POLYMERS?	47
<i>Bernhard Wunderlich</i>	
MULTI-LAYER AUTOMOTIVE CABLE IS ANALYZED USING TG-IR HYPHENATED TECHNIQUE	51
<i>Andrew Salamon, Maria Garavaglia, Peng Ye, Kevin Menard, Robert Packer</i>	
DECOMPOSITION OF KRYTOX® LUBRICANTS WITH/WITHOUT THE PRESENCE OF ALUMINA – A STUDY USING TGA-MS	58
<i>Mimi Y. Keating, Jon L Howell</i>	
TGA-MS STUDY OF THE DECOMPOSITION OF PHOSPHORUS-CONTAINING IONIC LIQUIDS - TRIHEXYL(TETRADECYL)PHOSPHONIUM DECANOATE AND TRIHEXYLTETRADECYLPHOSPHONIUM BIS[(TRIFLUOROMETHYL)SULFONYL] AMIDE	71
<i>Mimi Y. Keating, Feng Gao, Jane B Ramsey</i>	
NANOSCALE FOOD PROTEIN FIBRIL DISPERSIONS AND GELS: CREATION, AND STRUCTURAL AND RHEOLOGICAL CHARACTERISTICS	81
<i>M. A. Rao, S. M. Loveday, H. Singh</i>	
EFFECT OF CARBON NANOTUBES CRYSTAL STRUCTURE ON ADSORPTION KINETICS OF SMALL MOLECULES – AN EXPERIMENTAL STUDY UTILIZING ULTRA-HIGH VACUUM THERMAL ANALYSIS TECHNIQUES	86
<i>Uwe Burghaus</i>	
THERMAL INACTIVATION OF FOODBORNE PATHOGENS AND THE USDA PATHOGEN MODELING PROGRAM	95
<i>Vijay K. Juneja</i>	
RHEOLOGY AND THERMAL PROPERTIES WHEY PROTEIN AND STARCH BLENDS	102
<i>Charles I. Onwulata, Carlos W. P. Carvalho</i>	
THERMAL PROPERTIES OF NOVEL CURCUMIN CONTAINING AROMATIC ETHER-SILOXANE COPOLYMERS	105
<i>Yen Wei, Indraneil Mukherjee, Kerry Drake</i>	
SOY ADDITION IMPROVES MICROWAVABLE PARBAKED DOUGHS	107
<i>Luca Serventi, Joseph Sachleben, Yael Vodovotz</i>	
REAL TIME PHOTO-CURING REACTION MEASUREMENT AND THERMAL PROPERTIES OF UV CURING RESIN FOR NANOIMPRINT	112
<i>Yuichi Kasai, Nobuaki Okubo, Toshihiko Nakamura</i>	
A COMPARISON OF DEGRADATION KINETICS FOR AEROSPACE WIRE INSULATION MATERIALS	119
<i>Peter R. Hondred, Sungho Yoon, Nicola Bowler, Michael R. Kessler</i>	
LOCAL THERMAL ANALYSIS USING ATOMIC FORCE MICROSCOPY	125
<i>Marianne E. Harmon</i>	
IMPACT OF THE HYDROPHILIC BLOCK ON THE GLASS TRANSITION OF SPIDER SILK BLOCK COPOLYMERS	133
<i>Wenwen Huang, Sreevidhya Krishnaji, Xiao Hu, David Kaplan, Peggy Cebe</i>	
CURING STUDY OF AN EPOXY SYSTEM BY PRESSURE MODULATED TEMPERATURE DSC	140
<i>C. Gracia-Fernández, J. Tarrío-Saavedra, J. López-Beceiro, S. Naya, R. Artiaga</i>	
EVALUATION OF CO₂ ADSORPTION CAPACITY OF SOLID SORBENTS	148
<i>Houyin Zhao, Yan Cao, Quentin Lineberry, Wei-Ping Pan</i>	

ELECTRON MICROSCOPY, ELECTROCHEMICAL, AND THERMAL ANALYSIS OF HIGH SURFACE AREA CARBON WITH ELECTRODEPOSITED PT AND PTRU NANOPARTICLES	158
<i>Diana Santiago, Alvaro Mayoral, Miguel Yacaman, Amit Palkar, Luis Echegoyen, Carlos R. Cabrera</i>	
THERMAL AND RHEOLOGICAL PROPERTIES OF POLY-(3-HYDROXYBUTYRATE-CO-3-HYDROXYVALERATE) AND POLY (LACTIC ACID) BLENDS.....	169
<i>Sunny Modi, Kurt Koelling, Yael Vodovotz, Kurt Koelling, Yael Vodovotz</i>	
EFFECT OF NANOCCLAY ON THE THERMAL BEHAVIOR OF PLA FIBERS	178
<i>P. Badrinarayanan, F. K. Ko, M. R. Kessler</i>	
CHOOSING A HEATING RATE FOR THE THERMAL ANALYSIS OF ENERGETIC MATERIALS BY DIFFERENTIAL SCANNING CALORIMETRY	179
<i>Stephen Davis, Alejandra Gutierrez</i>	
ESTIMATION OF TIME TO MAXIMUM RATE UNDER ADIABATIC CONDITIONS (TMRAD) USING KINETIC PARAMETERS DERIVED FROM DSC - INVESTIGATION OF THERMAL BEHAVIOR OF 3-METHYL-4-NITROPHENOL.....	188
<i>Bertrand Roduit, Patrick Folly, Alexandre Sarbach, Beat Berger, Franz Brogli, Francesco Mascarello, Mischa Schwaninger, Thomas Glarner, Eberhard Irle, Fritz Tobler, Jacques Wiss, Markus Luginbühl, Craig Williams, Pierre Reuse, Francis Stoessel</i>	
MORPHOLOGY AND PHASE STRUCTURE OF ELECTROSPUN NANOFIBERS OF PET WITH SILICON DIOXIDE NANOPARTICLES.....	205
<i>Qian Ma, Bin Mao, Peggy Cebe</i>	
THERMAL EXPANSION, AGEING, RELAXATIONS AND POST-CURE OF POLYMER COMPOSITES USING MODULATED TEMPERATURE THERMOMECHANOMETRY.....	214
<i>Robert A. Shanks</i>	
GELATINIZATION OF STARCH CHARACTERIZED USING MODULATED TEMPERATURE DIFFERENTIAL SCANNING CALORIMETRY	226
<i>Robert A. Shanks, Wasantha Gunaratne</i>	
COLOR-DETECTED THERMAL DEGRADATION OF POLYVINYL CHLORIDE	236
<i>Vadim V. Krongauz, Yann-Per Lee, Anthony Bourassa</i>	
CARBON CARBON COMPOSITE FILTER PRECURSOR CHARACTERIZATION THROUGH THERMAL ANALYSIS	246
<i>A. Sfakianakis, V. M. Drakonakis, J. C. Seferis, G. C. Papanicolaou, C. C. Doumanidis</i>	
THERMAL AGEING AND RELAXATION OF CORE-CROSSLINKED STAR CONTAINING COMPOSITES USING MODULATED TEMPERATURE-THERMOMECHANOMETRY.....	255
<i>Steven Spoljaric, Tor Kit Goh, Anton Blencowe, Greg Qiao, Robert A. Shanks</i>	
THE KINETIC SIMULATION OF THERMALLY STIMULATED POLARIZATION CURRENT (TSPC) BASED ON THE FROHLICH TWO-STATE MODEL	266
<i>George Collins</i>	
COMPARATIVE INSTRUMENT METHODS FOR ENERGETIC THERMAL STABILITY	283
<i>Daniel N. Sorensen, Debra L. Knott, Billy R. White</i>	
STANDARD PROTOCOL FOR TEMPERATURE CALIBRATION WITH PHARMACEUTICALS OF SCANNING THERMAL MECHANICAL ANALYZERS.....	294
<i>Shravan Singh Thakur, Manik Pavan Kumar Maheswaram, Dhruthiman Manthen, Hareesha Venumuddala, Lakshmi Kaza, Indika Perera, Alan Riga, Kenneth Alexander</i>	
SPECTROSCOPIC AND RHEOLOGICAL CHARACTERIZATION OF REVERSIBLY CROSS-LINKING GELS.....	298
<i>Amy M. Peterson, Giuseppe R. Palmese</i>	
THERMAL CHARACTERIZATION OF STYRENE POLYMERS CONTAINING PHOSPHORUS FLAME-RETARDING UNITS	302
<i>B. A. Howell, A. Dumitrascu</i>	
THERMAL PROPERTIES OF A DIFUNCTIONAL MONOMER DERIVED FROM ISOPHTHALOLYL CHLORIDE AND ANISOLE	313
<i>B. A. Howell, Li Zhang</i>	
THERMAL CHARACTERISTICS OF PRECURSORS TO A DIFUNCTIONAL IMIDE MONOMER.....	323
<i>B. A. Howell, H. Dangalle, M. Al-Omari</i>	
THERMAL STABILITY OF POLY(ETHER) AND TRIARYLPHOSPHATE HYDRAULIC FLUIDS	340
<i>B. A. Howell, M. Al-Omari</i>	
THERMAL PROPERTIES OF ESTERS/ETHERS DERIVED FROM TARTARIC ACID	352
<i>B. A. Howell, W. Sun</i>	
THERMAL STABILITY OF 2,2-DIARYL/DIALKYL-4,4,5,5-TETRAARYL-1,3-DIOXA-2-SILOLES	357
<i>B. A. Howell, Y.-J. Cho</i>	

THERMAL DECOMPOSITION OF 1,1,2,2-TETRAARYL-1,2-ETHANDIOLS	372
<i>B. A. Howell , Y.-J. Cho, Z.-R. Feng</i>	
THERMAL PROPERTIES OF PHOSPHINATED DERIVATIVES OF TARTARIC ACID	383
<i>B. A. Howell, H. Dangalle</i>	
THERMAL CHARACTERIZATION OF STYRENE POLYMERS CONTAINING PHOSPHORUS FLAME-RETARDING UNITS	399
<i>B. A. Howell, A. Dumitrascu</i>	
USE OF TGA/FT-IR IN MATERIAL CHARACTERIZATION	410
<i>Thomas W. Miller</i>	
CHARACTERIZATION OF FIBER-REINFORCED POLY(VINYL ALCOHOL) HYDROGELS FOR SYNTHETIC MENISCAL REPLACEMENT	420
<i>Julianne L. Holloway, Anthony M. Lowman, Giuseppe R. Palmese</i>	
ARCHITECTURAL EFFECTS ON THE VISCOELASTIC BULK RESPONSE IN POLYSTYRENE	429
<i>Jiayi Guo, Miao Hu, Sindee L. Simon</i>	
CHARACTERIZATION OF A CLAY BY TG-DSC-MS AND DILATOMETER-MS MEASUREMENTS	435
<i>E. Post, G. Kaiser, D. Shepard</i>	
THE TMA 402 F1 HYPERION: A NEW HIGH PERFORMANCE THERMOMECHANICAL ANALYZER	439
<i>E. Post, D. Rapp, D. Shepard, G. Storch</i>	
APPLICATION OF THERMAL ANALYSIS IN PRESERVATION AND RESTORATION OF HISTORIC MASONRY MATERIALS; PART A CHARACTERIZATION OF MATERIALS	444
<i>Denis A. Brosnan, John P. Sanders, Stephanie A. Hart</i>	
KINETICS AND SAFETY ANALYSIS OF SULFIDE MINERAL SELF-HEATING	453
<i>Abduljelil Iliyas, Kelly Hawboldt, Faisal Khan</i>	
ON THE THERMAL STABILITY OF NANOCRYSTALLINE MG-MATRIX COMPOSITES REINFORCED WITH MAX PHASES	465
<i>Babak Anasori, Shahram Amini, José M. Córdoba Gallego, Luke Daemen, Andrew R. McGhie, Chaoying Ni, Lars Hultman, Magnus Odén, Michel W. Barsoum</i>	
COMBUSTION CHARACTERISTICS OFFSHORE NEWFOUNDLAND LIGHT CRUDE OILS FOR AIR INJECTION EOR	466
<i>Tajudeen Bello, Abduljelil Iliyas, Kelly Hawboldt, Faisal Khan</i>	
THERMAL ANALYSIS OF HIGH-TEMPERATURE FAST REACTIONS IN ENERGETIC MATERIALS	475
<i>Alexander Shteinberg</i>	
PHASE STRUCTURE OF POLY(TRIMETHYLENE TEREPHTHALATE) STUDIED BY QUASI- ISOTHERMAL CALORIMETRY	487
<i>Qian Ma, Georgi Georgiev, Peggy Cebe</i>	
AUTOIGNITION MATERIAL DEVELOPMENT FOR ROCKET MOTOR ACTIVE MITIGATION	492
<i>Scott D. Hall, Gregory D. Knowlton</i>	
NOVEL METHOD FOR DRUG DISINTEGRATION OF TABLETS AND CAPSULES BY USING ISO-TMA	503
<i>Visweswararao Badipatla, N. Indika Perera, Manik Pavan Maheswaram, D. Pohlan, K. Alexander, Alan Riga</i>	
POLARIZATION OF MICRO-MOLECULES AND MACRO-MOLECULES WITH AC ELECTRIC FIELD TO ENHANCE DRUG DELIVERY IN AN ANIMAL MODEL WITH RESPECTIVE TO TEMPERATURE	505
<i>Lakshmi Kaza, Ellen Mathews, Ken Alexander, Vadim Lvovich, Alan Riga</i>	
PREMELT STUDIES OF DRUGS AND OTHER SOLIDS BY DIELECTRIC AND CALORIMETRIC ANALYSIS	518
<i>Dhruthiman R. Mantheni, Manik Pavan Maheswaram, Alan Riga, S. Alexander Kenneth</i>	
SYNTHESIS AND WATER SORPTION OF ENG-CAPPED POLYLACTIDES	525
<i>Donghun Koo, An Du, Giuseppe R. Palmese, Richard A. Cairncross</i>	
INVESTIGATIONS INTO THE POSSIBLE CORRELATION BETWEEN MORPHOLOGY AND THERMAL PROPERTIES OF POLY(2- METHOXY-5-(2'-ETHYLHEXYLOXY)-1,4- (PHENYLENE VINYLENE) (MEH-PPV) FILMS CAST USING DIFFERENT SOLVENTS	531
<i>Paul Rementer, Georgia A. Arbuckle-Keil</i>	
EVALUATION OF DIFFERENT ANTIOXIDANTS IN POLYETHYLENE USING OXIDATION INDUCTION TIME	534
<i>W-K Wong, Y. Grace Hsuan</i>	
SOLID STATE MECHANICAL PROPERTIES OF CRYSTALLINE DRUGS AND EXCIPIENTS SUBSTANTIATE NEWLY DISCOVERED VISCO-ELASTIC CHARACTERISTICS	543
<i>M. S. Shravan Singhthakur, Manik Pavan Kumar Maheswaram, Dhruthiman Reddy Mantheni, Alan T. Riga</i>	

USE OXIDATIVE INDUCTION TIME TO EVALUATE ANTIOXIDANTS IN POLYETHYLENE CLAY NANOCOMPOSITE	548
<i>S. Cheng, W. K. Wong, I. Ahmad, Y. G. Hsuan, C. Y. Li, R. Cairncross</i>	
STANDARD TEST PROTOCOL FOR TEMPERATURE CALIBRATION WITH PHARMACEUTICALS OF DIFFERENTIAL SCANNING CALORIMETRY	558
<i>Dhrythiman Mantheni, Manik Pavan Maheswaram, Shravan Singh Thakur, Alan Riga, Alexander Kenneth</i>	
COMPARATIVE THERMAL ANALYSIS OF READILY AVAILABLE REFERENCE POLYMERS	563
<i>Jeffrey A. Fruscella, Alan T. Riga</i>	
A SIMPLE NONISOTHERMAL METHOD FOR DETERMINING KINETIC PARAMETERS FROM THERMAL ANALYSES	572
<i>Richard E. Lyon, Natallia Safronava</i>	
ALAN T. RIGA THE SCIENTIST AND HIS CONTRIBUTIONS TO DEVELOPING THERMAL STANDARDS	584
<i>L. Judovits, T. O'Toole</i>	
LATTICE BOLTZMANN SIMULATION OF MAGNETOHYDRODYNAMIC VISCOUS FLOW IN A POROUS MEDIUM RECTANGULAR CAVITY WITH AN APPLIED VERTICAL MAGNETIC FIELD	587
<i>A. Hasanpour, M. Farhadi, H. R. Ashorynejad, K. Sedighi</i>	
LASER FLASH ANALYSIS AS A METHOD FOR PREDICTING THERMAL CONDUCTIVITY OF PITCH BASED CARBON FIBERS FROM MEASUREMENTS ON CARBON FIBER-EPOXY COMPOSITES	599
<i>Rebecca Alway-Cooper, Merlin Theodore, David P. Anderson, Amod A. Ogale</i>	
THERMAL CONDUCTIVITY OF EXFOLIATED GRAPHITE NANOPATELET PAPER	604
<i>Jinglei Xiang, Lawrence T. Drzal</i>	
JETTING OF DILUTE POLYMER SOLUTIONS	606
<i>Deepak Doraiswamy, Rakesh K. Gupta, Long Han</i>	
THE GLASS TRANSITION IN SEMICRYSTALLINE MACROMOLECULES	615
<i>Joseph D. Menczel</i>	
EVOLVED GAS AND KINETIC STUDIES ANALYSIS OF NICKEL AMINE COMPLEXES IN THE SOLID STATE	626
<i>K. S. Rejitha, Suresh Mathew</i>	
ANALYSIS OF A POLYCARBONATE CONNECTOR CRACKING PROBLEM	640
<i>H. E. Bair, A. J. Muller, R. G. Drach, J. J. Blee, E. D. Nelson</i>	
ANALYSIS OF POROUS SCREEN EFFECT IN FLOW FIELD AND HEAT TRANSFER IN A CHANNEL PARTIALLY FILLED WITH POROUS MEDIUM	649
<i>A. Hasanpour, M. Farhadi, K. Sedighi</i>	
TIME-RESOLVED RHEOMETRY DURING SLOW “RIPENING” OF CTPB/C18-CLAY NANOCOMPOSITE	661
<i>Xiaoliang Wang, Pingchuan Sun, Gi Xue, H. Henning Winter</i>	
LOW TEMPERATURE FLOW OF PVC CHAINS	663
<i>Gi Xue, Xiaoliang Wang, Chao Teng</i>	
CURING BEHAVIOR OF EVA IN PHOTOVOLTAIC MODULES STUDIED BY DSC AND DMA	666
<i>Steve Sauerbrunn, Angela Hammer, Rudolf Riesen, Markus Schubnell</i>	
DSC AND MICROSCOPY – TO SEE WHAT YOU CANNOT SEE ON DSC CURVES	667
<i>Steve Sauerbrunn, Markus Schubnell</i>	
FORMULATION AND CHARACTERIZATION OF BIO-BASED THERMOSETS FOR GEL COATS AND COMPOSITE APPLICATIONS	669
<i>Anh-Phuong T. Nguyen, Joshua M. Sadler, John J. La Scala</i>	
TOUGHNESS OF EPOXIES CURED WITH BIMODAL BLENDS OF POLYETHERAMINES	678
<i>Ian M. McAninch, Giuseppe R. Palmese, Joseph L. Lenhart, John J. La Scala</i>	
METALS WITH COORDINATED SALICYLIC ACID AND HOW DSC CAN DIFFERENTIATE BETWEEN THE MONO-, DI-, AND TRI-SALICYLATE COMPLEXES	686
<i>Christa Hockensmith, Stephen Davis, Alexandra Gutierrez</i>	

A DECREASE OF TG IN POLYSTYRENE WITH VARIOUS PACKING DENSITIES	694
<i>Chao Teng, Xiaoliang Wang, Gi Xue</i>	
STRUCTURAL REORGANIZATION OF LIQUID CRYSTALS REVEALED BY FAST SCANNING CALORIMETER.....	697
<i>Jing Jiang, Wei Jiang, Dongshan Zhou, Gi Xue</i>	
USE OF DSC AND DMA TECHNIQUES TO HELP INVESTIGATE A MATERIAL ANOMALY FOR PTFE USED IN PROCESSING A PISTON CUP FOR THE URINE PROCESSOR ASSEMBLY (UPA) ON INTERNATIONAL SPACE STATION (ISS)	701
<i>Doug Wingard</i>	
TEMPERATURE DEPENDENCE OF THE ELECTRICAL TRANSPORT PROPERTIES OF TITANIUM CARBIDE DERIVED CARBONS.....	713
<i>Preethi Gopu, Mariem Rosario-Canales, Patrick M. Vora, James Kikkawa, Carlos R Perez, Yury Gogotsi, Jorge Juan Santiago Aviles</i>	
Author Index	