

41st Annual Conference of the North American Thermal Analysis Society 2013

**Bowling Green, Kentucky, USA
4-7 August 2013**

ISBN: 978-1-62993-241-5

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© (2013) by the North American Thermal Analysis Society
All rights reserved.

Printed by Curran Associates, Inc. (2013)

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

Effects of Micro-/Nano-Aluminum on Thermal Decomposition of Hexogen/Ammonium Perchlorate	1
<i>Yan-Li Zhu, Qing-jie Jiao, Hao Huang, Hui Ren</i>	
Thermal Decomposition of RDX/AP by TG-DSC-MS-FTIR	12
<i>Qing-Jie Jiao, Yan-Li Zhu, Hao Huang, Hui Ren</i>	
Pyrolysis Characteristics and Kinetics of Fresh Biomass with Different Initial Moisture	24
<i>Mingxu Zhang, Fanfei Min</i>	
Thermal Conductivity of Thick Film Tungsten Metallization used in High-Alumina Ceramic Microelectronic Packages	35
<i>Mark Eblen</i>	
Estimation of Thermal Hazard and Thermal Stability Parameters for Tert-Butyl Peroxy-2-Ethyl Hexanoate by Theoretical Kinetic Model and Mass Spectrometry	50
<i>Yun-Ting Tsai, Mei-Li You, Fang-Chang Tsai, Chi-Min Shu</i>	
Thermal Stability Analysis of Dicumyl Peroxide by Advance Kinetics-based Simulation Approach	57
<i>Na Zang, Xin Ming Qian, Chi-Min Shu</i>	
Material Characterization of Heat Shrinkable Film: A Comparability Study	68
<i>Zehra Kalkan-Sevinc, Caitlin Strobel</i>	
Moisture Effect on Melt Rheology of Copolyester Thermoplastic Polyester Elastomer (TPE) Blend	82
<i>Zehra Kalkan-Sevinc, Caitlin Strobel, Michael Ling, Yann-Per Lee</i>	
Characteristics of Biomass Chemical Looping Gasification Using Iron Ore as an Oxygen Carrier	96
<i>Zhen Huang, Fang He, Kun Zhao, Yipeng Feng, Anqing Zheng, Sheng Chang, Zengli Zhao, Haibin Li</i>	
The Use of Three-Dimensionally Ordered Macroporous (3DOM) LaFeO₃ Perovskites as Oxygen Carriers in Chemical-Looping Reforming of Methane	110
<i>Fang He, Kun Zhao, Zhen Huang, Xinai Li, Guoqiang Wei, Haibin Li</i>	
Thermal Study of HNIW and Mixtures Containing Aluminum Powder	123
<i>Mei Xiang, Qing-Jie Jiao, Yan-Li Zhu, Jinyang Yu, Liping Chen</i>	
Existence of Time Lag in Crystalline to Smectic A (K- SmA) Phase Transition of 4-Decyl-4-Biphenylcarbonitrile (10CB) Liquid Crystal	132
<i>D. Sharma</i>	
Environmental Consciousness in Japan after the Great East Japan Earthquake and Application to Thermal Analysis - Analysis using Eco-MCPS, a Web-database for Ecomaterials and Products	143
<i>Riko Ozao, Taisuke Utsumi, Takuya Ishii, Yoshikazu Shinohara, Hideki Kakisawa</i>	
Novel Validation on Pressure as a Determination of Onset Point for Exothermic Decomposition of DTBP	144
<i>Yih-Shing Duh, Wen-Fang Wang, Chen-Shan Kao</i>	
Reactive Hazard Assessments of the Symmetrical Organic Peroxides via Calorimetric Techniques	155
<i>Yih-Shing Duh, Shih-Yueh Wu, Chen-Shan Kao</i>	
Thermal Decompositions of Dialkyl Peroxides Studied by DSC	165
<i>Yih-Shing Duh, Jin-Min Yo, Wen-Lian Lee, Chen-Shan Kao, Jing-Ming Hsu</i>	
Thermal Instabilities of Organic Carbonates with Charged Cathode Materials in Lithium-ion Batteries	175
<i>Yih-Shing Duh, Chen-Shan Kao, Wei-Jie Ou, Jing-Ming Hsu</i>	
Thermal Analysis of Oriented Polymeric Systems	189
<i>Joseph D. Menczel, Prashanth Badrinarayanan</i>	
Lanthanum-Promoted Copper-Based Oxygen Carriers for Chemical Looping Combustion Process	198
<i>Yan Cao, Hou-Yin Zhao, Song Sit, Wei-Ping Pan</i>	
Thermal Behavior of Cashew Gum by Simultaneous TGA/DTG/DSC-FTIR	211
<i>Cheila Mothe, Jaqueline Souza de Freitas</i>	
Thermal Evaluation of Base Bleed Propellants	217
<i>Priscila Simoes Paula, Cheila Mothe, Michelle Mothe</i>	
Thermal Instability of Organic Esters and Ethers with Deposited Lithium in Lithium-Ion Battery	223
<i>Yi-Chun Li, Yih-Shing Duh, Jing-Ming Hsu, Chen-Shan Kao</i>	
Investigation of Radical Polymerization Kinetics using DSC and Detailed Mechanistic or Isoconversional Methods	233
<i>Dimitris Achilias</i>	

A Model-Free Method for Evaluating Theoretical Error of Kissinger Equation	244
<i>Yi Cheng, Yanchun Li, Chuan Huang, Xuqiang Zhu</i>	
Heat Capacity of poly(3-hydroxybutyrate)	251
<i>A. Czerniecka, M. Pyda</i>	
Model Free Kinetics of the Reaction of Epoxies with Aromatic Diamines	261
<i>V. Zvetkov, V. Calado, S. Djoumaliiisky</i>	
Simultaneous Measurement of Thermogravimetry-Differential Thermal Analysis and Miniature Ion Trap Mass Spectrometry equipped with Skimmer-type Interface, TG-DTA-ITMS	272
<i>Tadashi Arii, Lani Celiz</i>	
Dielectric Analysis and Differential Scanning Calorimetry Studies Led to a Unified Theory of Polar Conduction of Organic and Inorganic Materials	275
<i>Alan Riga, Ieda Santos, Dhruthiman Mantheni, M.P.K. Maheswaram</i>	
The Glass Transition and Rheology of a Polystyrene Nanocomposite	287
<i>Ran Tao, Sindee L. Simon</i>	
Current Dielectric Thermal Analysis Measurements of Polar Ionic Conduction and the DSC Neel Temperature Magnetic Evaluation of NiO Establishes the Longevity Single Crystals (100) of Lithiated NiO	293
<i>Alan Riga</i>	
Controlled Morphology of Thin Film Silicon Integrated With Environmentally Responsive Hydrogels	297
<i>Prithwish Chatterjee, Eric C. Stevens, Yuping Pan, Teng Ma, Hanqing Jiang, Lenore L. Dai</i>	
Crystallization Kinetics of Ti₂₀Zr₂₀Cu₆₀ Metallic Glass by Iso-conversional Methods using Modulated Differential Scanning Calorimetry	304
<i>Supriya Kasyap, Ashmi Patel, Arun Pratap</i>	
Estimation of Critical Cooling Rate for Binary Metallic Glasses Using TTT Diagram	315
<i>Sonal Prajapati, Ashmi T. Patel, Arun Pratap</i>	
Understanding Cold-Cap Reactions of Nuclear Waste Feeds through Evolved Gas Analysis (EGA)	322
<i>Jaehun Chun, Carmen Rodriguez, Michael Schweiger, Pavel Hrma</i>	
Evaluation of Thermal Hazard For Commercial 14500 Lithium-Ion Batteries	324
<i>Tsai-Ying Hsieh, Yu-Yun Sun, Yih-Shing Duh, Chen-Shan Kao</i>	
Thermal Behavior of Lithium-Ion Battery Electrolytes with Differential Scanning Calorimeter	330
<i>Yu-Yun Sun, Tsai-Ying Hsieh, Yih-Shing Duh, Chen-Shan Kao</i>	
Optimizing Fitting Parameters in Thermogravimetry	335
<i>Matilde Rios-Fachal, Javier Tarrio-Saavedra, Jorge Lopez-Beceiro, Salvador Naya, Ramon Artiaga</i>	
Thermal Characterization of poly-L-lactide by Dielectric Analysis and Modulated DSC	346
<i>Carlos Gracia-Fernandez, Silvia Gomez-Barreiro, Ana Alvarez-Garcia, Jorge Lopez-Beceiro, Begona Alvarez-Garcia, Sonia Zaragoza-Fernandez, Ramon Artiaga</i>	
Thermal Degradation of Trimethylolpropane/Adipic Acid Hyperbranched Poly(ester)s	354
<i>Tracy Zhang, Bob Howell, Patrick Smith</i>	
Limited Oxygen Index and Flame retardancy of Functionalized Novolacs / Epoxy Composites on Glass Fiber Cloth	373
<i>Hsin-Ho Wu, Wei-Ta Yang, Ching-Chen Hsieh</i>	
TGA Measurement of Reactivity of Candidate Oxygen Carrier Materials	387
<i>Luis Yamarte, Derek Paxman, Shahnaz Begum, Partha Sarkar, Allan Chambers</i>	
Melt Miscibility of Blends of Homogeneous isotactic Propylene-1-Hexene Copolymers	396
<i>Hamed Janani, R.G. Alamo</i>	
Combined Methods of Thermal Analysis for Characterization of Rocks Containing Hydrocarbon	403
<i>Zachariah Jaco, Janusz Grebowicz</i>	
Thermal Properties of Oil Shales at High Temperature: Towards Integration of Nuclear Power with Production of Natural Hydrocarbons	409
<i>Janusz Grebowicz</i>	
Environmentally Friendly Surfactant Additives for Nucleate Pool Boiling Enhancement	421
<i>Birce Dikici, Eno Edidiong</i>	
Flame Retardant Potential of Phosphorus Esters	433
<i>Bob Howell</i>	
Thermal Properties of Nanomodified Asphalts Binders	437
<i>Michelle Mothe, Mariana Ferreira Pinto, Cheila Mothe, Leni Leite</i>	
Thermal Evaluation of Heavy Oils by Simultaneous TG/DTG/FTIR	442
<i>Michelle Mothe, Cheila Mothe, Carlos Henrique Carvalho</i>	

Dynamic Mechanical Analysis (DMA) to Help Characterize Vespel SP-211 Polyimide Material for Use as a 750^oF Valve Seal on the Ares I Upper Stage J-2X Engine	448
<i>Doug Wingard</i>	
Thermal Characterization of Cosmetics Developed from Keratin Hydrolyzed from Feathers Poultry.....	459
<i>Tomas Gutierrez, Michelle Mothe, Cheila Mothe</i>	
Monomer Distribution and Depletion in Vinylidene Chloride Copolymerization	465
<i>Douglas Beyer, Patrick Smith, Jeff Kosman, Christi Thieme, Bob Howell</i>	
TMDSC in Distinguishing Between the Hydrophobic and Hydrophilic Forces Driving the Self Assembly of Lipid Nanotubes	471
<i>Janis Matisons, Thomas Barclay</i>	
Thermal Analytical Investigation of Fossiliferous Concretion.....	475
<i>Heitor Fernandes Mothe Filho, Cheila Mothe</i>	
Thermal Properties Measuring of Biomass Porous Media based TPS Method and Thermal Conductivity Model	480
<i>Wen-kui Zhu, Hui Lin, Yan Cao, Bin Li</i>	
Author Index	