TECHNICAL PROGRAM OF THE 2016
INTERNATIONAL CONFEDERATION FOR
THERMAL ALANLYSIS AND CALORIMETRY
CONGRESS

August 14-19, 2016

Walt Disney World Swan and Dolphin Hotel
Orlando, Florida, USA

Conference Chair
Tina Adams
The Lubrizol Corporation

Conference Co-Chair
Meetings Councilor
Bob Howell
Central Michigan University

Technical Program Chair
North America
Eric Schoch
Northrop Grumman

Technical Program Chair
Asia
Riko Ozao
SONY Institute of Higher Education

Technical Program Chair
Europe
Crisan Popescue
Kao Germany GmbH

Technical Program Chair
North America
Eric Schoch
Northrop Grumman

Conference Proceedings
Chair
Elizabeth Pelczar
Innophos, Inc.

Exhibition Chair
Tina Adams
The Lubrizol Corporation

Award Chair
Andrew McGhie
University of Pennsylvania

NATAS Staff Management
Greg Jewell
AEC Management Resources

Special Planning Counsel from ICTAC
Don Burlett
Immediate Past President of ICTAC
# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program at a Glance</td>
<td>Inside front cover</td>
</tr>
<tr>
<td>Table of Contents</td>
<td>2</td>
</tr>
<tr>
<td>President’s Message</td>
<td>3</td>
</tr>
<tr>
<td>Session Organizers</td>
<td>4</td>
</tr>
<tr>
<td>Exhibitors</td>
<td>5</td>
</tr>
<tr>
<td>ICTAC Award Recipients</td>
<td>6</td>
</tr>
<tr>
<td>ICTAC Previous Award Recipients</td>
<td>7</td>
</tr>
<tr>
<td>NATAS Award Recipients</td>
<td>10</td>
</tr>
<tr>
<td>NATAS Previous Award Recipients</td>
<td>11</td>
</tr>
<tr>
<td>Conference Sponsors</td>
<td>13</td>
</tr>
<tr>
<td>ICTAC Officers &amp; Advisory Board</td>
<td>14</td>
</tr>
<tr>
<td>NATAS Officers &amp; Councilors</td>
<td>15</td>
</tr>
<tr>
<td>NATAS Committee Chairs</td>
<td>16</td>
</tr>
<tr>
<td>2016 ICTAC Conference Committee</td>
<td>17</td>
</tr>
<tr>
<td>The 2016 International Confederation for Thermal Analysis and Calorimetry</td>
<td>18</td>
</tr>
<tr>
<td>Author Index</td>
<td>64</td>
</tr>
<tr>
<td>Map of Meeting Rooms</td>
<td>Inside back cover</td>
</tr>
</tbody>
</table>

© North American Thermal Analysis Society. All rights reserved. Individual authors may reproduce their contribution for personal or company use. Additional copies of ICTAC 2016 conference abstracts and papers can be obtained by contacting: NATAS c/o Thermal Analysis Laboratory, Western Kentucky University, The Center for Research and Development, 2413 Nashville Road, Bowling Green, KY 42101. Phone: 270-745-2220, Fax: 270-745-2221, Email: natas@wku.edu.

Printed by X-CD Technologies, Toronto, Ontario, Canada, www.x-cd.com
President’s Message

It is my great pleasure to welcome you to the 2016 International Confederation for thermal Analysis and Calorimetry conference in Orlando, FL, hosted by the North American Thermal Analysis Society.

This exciting weeklong conference will cover 23 technical sessions, with the topics ranging from biomaterials to energetic and inorganic materials, from fast scanning methods to high temperature thermal analysis, from polymer stability to phase transformation, from pharmaceuticals to personal care, from materials processing to process safety. The nearly 300 presentations from our worldwide attendees will be showcased in four concurrent sessions, spanning from August 15 to 19th. I am confident that you will find the lectures interesting and of high quality.

The meeting was organized by Conference Chair Tina Adams, Co-chair Bob Howell, and Technical Program Co-chairs Eric Schoch (Americas), Riko Oza (Asia), and Crisan Popescu (Europe). I would like to personally thank all of them for their tireless effort. In particular, I would like to express my sincere gratitude to Tina Adams, whose leadership and hard work are instrumental to the success of the conference.

I would also like to take this opportunity to congratulate NATAS award winners including:
1) Akihiko Toda (Hiroshima University), (NATAS Award for Outstanding Achievement, sponsored by Mettler-Toledo);
2) Janis Matisons (Gelest), (NATAS Fellow, sponsored by Netzsch Instruments North America)
3) Tina Adams (Lubrizol Corporation), (NATAS Outstanding Service Award, sponsored by Netzsch Instruments North America)
4) Zichao Ye (University of Illinois at Urbana-Champaign), (NATAS SETARAM Best Paper Award)

In addition, ten student travel awards sponsored by NATAS and TAFDV were given to help defray the costs of attending NATAS.

The exhibition this year includes eleven vendors of instruments, supplies, and services for thermal analysts. Please visit the exhibitions to learn about the latest development in thermal analysis, and you may find exciting surprises that transform your research work.

As you enjoy the conference, please consider becoming active in the Society as a volunteer. We are always looking for talent and committed people, particularly young scientist including assistant professors and post-docs who just started their careers, to help run the Society. I can assure you that your willingness to participate in various events will be most welcome by the Society.

Enjoy Orlando!
<table>
<thead>
<tr>
<th>Session</th>
<th>Session Chair</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biomaterials, Biopolymers</td>
<td>Patrick Smith</td>
</tr>
<tr>
<td>Composites, Nanocomposites</td>
<td>Brian Grady</td>
</tr>
<tr>
<td>Energetic Materials and Thermal Hazards</td>
<td>Brandon Weeks, Wim de Klerk, Astumi Miyake, Chi-Min Shu</td>
</tr>
<tr>
<td>Fast Scanning Methods</td>
<td>Dimitri Iranov</td>
</tr>
<tr>
<td>Food Technology and Related Areas</td>
<td>Perla Relkin</td>
</tr>
<tr>
<td>Fuels and Biofuels</td>
<td>Steve Sauerbrunn</td>
</tr>
<tr>
<td>High Temperature Thermal Analysis</td>
<td>Edward Gorzkowski, Ricardo Castro</td>
</tr>
<tr>
<td>Inorganic Materials, Geochemistry and Ceramics</td>
<td>Ranjit K. Verma</td>
</tr>
<tr>
<td>Instrumentation and Methods</td>
<td>Stanislav Stoliavou, Kadine Mohomed</td>
</tr>
<tr>
<td>Kinetics and Catalysis</td>
<td>Sergey Vyazovkin, Nobuyoshi Koga, Jiri Malek</td>
</tr>
<tr>
<td>Lifetime Prediction</td>
<td>Ignacio Blanco</td>
</tr>
<tr>
<td>Materials Processing</td>
<td>Michael Kessler</td>
</tr>
<tr>
<td>Molecular Biophysics/Biochemistry</td>
<td>Anthony Mittermaier</td>
</tr>
<tr>
<td>Personal Care</td>
<td>Denise Rafferty</td>
</tr>
<tr>
<td>Pharmaceuticals</td>
<td>Wenwen Huang, Vesa-Pekka Lehto</td>
</tr>
<tr>
<td>Plastic Packaging</td>
<td>Douglas Beyer</td>
</tr>
<tr>
<td>Polymer Phase Transformation</td>
<td>Christopher Li</td>
</tr>
<tr>
<td>Polymer Stability, Degradation and Flammability</td>
<td>Jeremy Clifton, Mark Beach</td>
</tr>
<tr>
<td>Process Safety</td>
<td>Wassila Benaissa, Chi-Min Shu</td>
</tr>
<tr>
<td>Pyrolytic Methods</td>
<td>Alexander Koslov</td>
</tr>
<tr>
<td>Rheology and Viscoelasticity</td>
<td>Leela Rakesh, Jan Vermant</td>
</tr>
<tr>
<td>Standards, Regulations and Reference Materials</td>
<td>Roger Blaine, Haruka Abe</td>
</tr>
<tr>
<td>Sustainability, Bio-sourced Materials,</td>
<td>Wei-Ping Pan</td>
</tr>
<tr>
<td>Green Chemistry</td>
<td>Yuko Nishimoto</td>
</tr>
<tr>
<td>Thermal Analysis and Calorimetry in the Life Sciences</td>
<td>Paul Vaitiekunas</td>
</tr>
<tr>
<td>Thermal Analysis in Forensics</td>
<td>Alan Riga</td>
</tr>
<tr>
<td>Thermal Transport and Electrical Properties</td>
<td>Rob Campbell, Satoshi Endou</td>
</tr>
<tr>
<td>Thermodynamics and Thermochemistry</td>
<td>Alexander Lion</td>
</tr>
<tr>
<td>Thermoelectric Properties</td>
<td>Yoshikazu Shinohara</td>
</tr>
<tr>
<td>Glasses, Thermosets and Nanoconfinement</td>
<td>Yung Koh</td>
</tr>
<tr>
<td>Wood Technology</td>
<td>Mark Dietenberger, Thaddeus Maloney</td>
</tr>
</tbody>
</table>
2016 ICTAC Conference Exhibitors

AKTS AG TECHNOArk 1
3960 Siders
SWITZERLAND
+4 1 (0) 848 800 221
+4 1 (0) 848 800 222 Fax
broduit@akts.com
www.akts.com

Extrel CMS, LLC
575 Epsilon Drive
Pittsburgh, PA
412-963-7530
412-963-6578 Fax
info@extrel.com
www.extrel.com

Fauske and Associates, LLC
16 83rd Street
Burr Ridge, IL 60527
603-323-8750
http://www.fauske.com/contact-us
http://www.fauske.com

Hitachi High-Technologies America
PO Box 612208
1375 N. 28th Avenue
Dallas, TX 75261-2208
1-800-548-9001
Sales.LS@Hitachi-hta.com

Instrument Specialists, Inc.
133 E. Main Street
Twin Lakes WI 53181-0280
262-877-3600
info@instrument-specialists.com
http://instrument-specialists.com

Mettlar-Toldeo
1900 Polaris Parkway
Columbus, OH 43240
800-638-8537
www.MT.com

NanoTemper Technologies
400 Oyster Point Blvd. Suite 336
South San Francisco
CA 94080, USA
650-763-1658
info@nanotemper-technologies.com
http://www.nanotemper-technologies.com

Netzsch Instruments N.A. LLC
37 North Avenue
Burlington, MA 01803
781-272-5353
781-272-5225 Fax
NIB-Sales@Netzsch.com
www.NETZSCH.com

Perkin Elmer
2000 York Road, Suite 132
Oak Brook, IL 60523
815-999-7112
www.perkinelmer.com

TA Instruments
159 Lukens Drive
New Castle, DE 19734
302-427-4000
302-427-4001 Fax
info@tainstruments.com
www.tainstruments.com

Thermtest, Inc.
34 Melissa St #1
Fredericton, NB
E3A 6W1, Canada
1-866-249-0077
info@thermtest.com

Setaram, Inc.
8430 Central Avenue, Suite C
Newark, CA 94560
510-793-3345
510-402-4705 Fax
setaramincsales@setaram.com
www.setaram.com
2016 ICTAC Award Recipients

ICTAC Robert Mackenzie Memorial Lectureship
Edward Charsley
United Kingdom

TA Instruments ICTAC Award
Vincent Mathot
The Netherlands

SETARAM – ICTAC Award for Calorimetry
Dénes Lőrinczy
Hungary

ICTAC Young Scientist Award
Andrei Rotaru
Romania

ICTAC Travel Grant Recipients (Young Scientists)
Dorien Baeten (Belgium)
Giuseppe Cavallaro (Italy)
Nicolas Delpouve (France)
Tibor Dubaj (Slovak Republic)
Nataliia Gorodylova (Czech Republic)
Joakim Riikonen (Finland)
ICTAC Previous Scientific Award Recipients

**TA Instruments ICTAC Award**

- 1977 Paul D Garn (USA)  
- 1980 Gianni Lombardi (Italy)  
- 1982 Patrick Gallagher (USA)  
- 1985 Robert Mackenzie (UK)  
- 1988 David Dollimore (UK)  
- 1992 Jaroslav Sestak (Czechoslovakia)  
- 1996 Berhard Wunderlich (USA)  
- 2000 Takeo Ozawa (Japan)  
- 2004 Stephen Chang (USA)  
- 2008 Colette Lacabane (France)  
- 2012 Jerzy Błażejowski (Poland)

**SETARAM - ICTAC Award for Calorimetry**

- 2000 Ingemar Wadsö (Sweden)  
- 2004 Hiroshi Suga (Japan)  
- 2008 Ingolf Lamprecht (Germany)  
- 2012 Anthony Beezer (UK)

**ICTAC Young Scientist Award**

- 1985 Dagmar Brandova (Czechoslovakia)  
- 1988 Judith Schlichter-Aronheim (Israel)  
- 1992 Jiří Málek (Czechoslovakia)  
- 1996 Nobuyoshi Koga (Japan)  
- 2000 Erqiang Chen (USA)  
- 2004 Christopher Li (USA)  
- 2008 Imre Miklós Szilágyi (Hungary)  
- 2012 Séverine Boyer (France)
ICTAC Previous Service Award Recipients

ICTAC Honorary Lifetime Membership

<table>
<thead>
<tr>
<th>Year</th>
<th>Name</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988</td>
<td>Robert Mackenzie</td>
<td>(UK)</td>
</tr>
<tr>
<td></td>
<td>Cornelius Murphy</td>
<td>(USA)</td>
</tr>
<tr>
<td>1992</td>
<td>Ferenc Paulik</td>
<td>(Hungary)</td>
</tr>
<tr>
<td>1994</td>
<td>Hans Seifert</td>
<td>(Germany)</td>
</tr>
<tr>
<td>1996</td>
<td>Harry McAdie</td>
<td>(Canada)</td>
</tr>
<tr>
<td>1998</td>
<td>Patrick Gallagher</td>
<td>(USA)</td>
</tr>
<tr>
<td>2006</td>
<td>Edward Charsley</td>
<td>(UK)</td>
</tr>
<tr>
<td>2010</td>
<td>Jean Rouquerol</td>
<td>(France)</td>
</tr>
<tr>
<td>2000</td>
<td>Shmuel Yariv</td>
<td>(Israel)</td>
</tr>
<tr>
<td></td>
<td>Ole Toft Sorensen</td>
<td>(Denmark)</td>
</tr>
<tr>
<td></td>
<td>Edith Turi</td>
<td>(USA)</td>
</tr>
<tr>
<td></td>
<td>Joseph Flynn</td>
<td>(USA)</td>
</tr>
<tr>
<td>2004</td>
<td>Eberhard Gmelin</td>
<td>(Germany)</td>
</tr>
<tr>
<td></td>
<td>Andrew McGhie</td>
<td>(USA)</td>
</tr>
<tr>
<td></td>
<td>Takeo Ozawa</td>
<td>(Japan)</td>
</tr>
<tr>
<td>2008</td>
<td>Michael Brown</td>
<td>(South Africa)</td>
</tr>
<tr>
<td>2012</td>
<td>Judit Simon</td>
<td>(Hungary)</td>
</tr>
<tr>
<td>2010</td>
<td>Eugen Segal</td>
<td>(Romania)</td>
</tr>
</tbody>
</table>

ICTAC Distinguished Service Award

<table>
<thead>
<tr>
<th>Year</th>
<th>Name</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>Shmuel Yariv</td>
<td>(Israel)</td>
</tr>
<tr>
<td></td>
<td>Ole Toft Sorensen</td>
<td>(Denmark)</td>
</tr>
<tr>
<td></td>
<td>Edith Turi</td>
<td>(USA)</td>
</tr>
<tr>
<td></td>
<td>Joseph Flynn</td>
<td>(USA)</td>
</tr>
<tr>
<td>2004</td>
<td>Eberhard Gmelin</td>
<td>(Germany)</td>
</tr>
<tr>
<td></td>
<td>Andrew McGhie</td>
<td>(USA)</td>
</tr>
<tr>
<td></td>
<td>Takeo Ozawa</td>
<td>(Japan)</td>
</tr>
<tr>
<td>2008</td>
<td>Michael Brown</td>
<td>(South Africa)</td>
</tr>
<tr>
<td>2012</td>
<td>Judit Simon</td>
<td>(Hungary)</td>
</tr>
<tr>
<td>2010</td>
<td>Eugen Segal</td>
<td>(Romania)</td>
</tr>
</tbody>
</table>
Previous Recipients of ICTAC Awards

ICTAC Robert Mackenzie Memorial Lectureship

2004  Anna Langier-Kuzniarowa (Poland)
       Shmuel Yariv (Israel)

2008  Lauri Niinistö (Finland)

2012  Takeo Ozawa (Japan)

ICTAC Travel Grant Recipients (Young Scientists)

2008  Laurent Delbreilh (France), Ryo Kanzaki (Japan), Agnieszka Lacz (Poland), Michael O'Neill (UK),
       Andrei Rotaru (Romania), Manuel Temprado (Spain).

2012  Loïc Favergeon (France), Iolanda Fotticchia (Italy), Alexander Kozlov (Russia), Giuseppe Lazzara
       (Italy), Roland Neher (Germany), Oana Stefanescu (Romania), Imre Szilagyi (Hungary).
2016 NATAS Award Recipients

NATAS Award in Thermal Analysis
(sponsored by Mettler-Toledo)
Akihiko Toda
Hiroshima University

NATAS Fellow
(sponsored by Netzsch Instruments, N.A. LLC)
Janis Matisons
Gelest Inc.

NATAS Outstanding Service Award
(sponsored by Netzsch Instruments N.A. LLC)
Tina Adams
Lubrizol Corporation

NATAS Best Student Paper Award
(Sponsored by SETARAM)
Zichao Ye, (University of Illinois at Urbana-Champaign) – NATAS SETARAM Best Paper Award
Size-dependent Melting of Structurally Segmented Aliphatic Lamellar Crystals

NATAS Student Travel Award
(sponsored by TAFDV, NATAS, Bruce Prime, and Andrew McGhie)
Xuejian Chen, Florida State University (Alamo)
Yoseph Daniel, Central Michigan University (Howell)
Simone Lazar, Central Michigan University (Howell)
Evelyn Lopez, Texas Tech University (Simon)
Eric Ostrander, Central Michigan University (Howell)
Richa Padhye, Texas Tech University (Pantoya)
Rachel Prado, University of Alabama (Vyazovkin)
Victoria Stanford, University of Alabama (Ýzazovkin)
Han Xia, University of Notre Dame (Brennecke)
Xiaoshi Zhang, Florida State University (Alamo)
**NATAS Previous Award Recipients**

<table>
<thead>
<tr>
<th>Mettler Award in Thermal Analysis</th>
<th>NATAS Outstanding Service Award</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015 R. Chartoff</td>
<td>2015 Q. Kwok</td>
</tr>
<tr>
<td>2014 S. Simon</td>
<td>2014 M. LaTorre</td>
</tr>
<tr>
<td>2013 P. Cebe</td>
<td>2013 B. Howell</td>
</tr>
<tr>
<td>2012 B. Howell</td>
<td>2012 S. Simon</td>
</tr>
<tr>
<td>2011 A. McGhie</td>
<td>2011 M. Varma-Nair</td>
</tr>
<tr>
<td>2008 W.-P. Pan</td>
<td>D. E. G. Jones</td>
</tr>
<tr>
<td>2007 E. L. Charsley</td>
<td>2008 T. S. Ramotowksi</td>
</tr>
<tr>
<td>2006 C. E. Schick</td>
<td>2007 M. J. Rich</td>
</tr>
<tr>
<td>2005 D. J. W. Grant</td>
<td>2006 W. Hammetter</td>
</tr>
<tr>
<td>2004 S. Vyazovkin</td>
<td>2005 L. Judovits</td>
</tr>
<tr>
<td>2003 G. Delia Gatta</td>
<td>2004 W. P. Pan</td>
</tr>
<tr>
<td>2002 V. Mathot</td>
<td>2003 D. Burlett</td>
</tr>
<tr>
<td>2001 G. McKenna</td>
<td>2002 B. Wunderlich</td>
</tr>
<tr>
<td>2000 M. Reading</td>
<td>2001 C. M. Earnest</td>
</tr>
<tr>
<td>1999 S. Cheng</td>
<td>2000 C. M. Neag</td>
</tr>
<tr>
<td>1998 A. Riga</td>
<td>1999 S. Dyszel</td>
</tr>
<tr>
<td>1997 Y. Kanna</td>
<td>1998 S. Mikhail</td>
</tr>
<tr>
<td>1996 M. E. Brown</td>
<td>1997 M. Keating</td>
</tr>
<tr>
<td>1995 J. C. Seferis</td>
<td>1996 J. Enns</td>
</tr>
<tr>
<td>1994 S. St. John Warne</td>
<td>1995 A. Riga</td>
</tr>
<tr>
<td>1993 Y. Godovsky</td>
<td>1994 L. Boyter</td>
</tr>
<tr>
<td>1992 H. Starkweather</td>
<td>1993 B. Bachman</td>
</tr>
<tr>
<td>1990 V. Balek</td>
<td>1991 R. Hutchinson</td>
</tr>
<tr>
<td>1989 R. B. Prime</td>
<td>1990 M. Steiner</td>
</tr>
<tr>
<td>1988 J. Rouquerol</td>
<td>1989 B. Fabricant</td>
</tr>
<tr>
<td>1987 H. Bair</td>
<td>1988 C. B. Murphy</td>
</tr>
<tr>
<td>1986 H. G. Wiedemann</td>
<td>1987 R. C. Johnson</td>
</tr>
<tr>
<td>1985 E. A. Turi</td>
<td>1986 H. McAdie</td>
</tr>
<tr>
<td>1984 L. Mandelkern</td>
<td>1985 P. Gallagher</td>
</tr>
<tr>
<td>1983 R. S. Porter</td>
<td>1984 J. J. Mauer</td>
</tr>
<tr>
<td>1981 T. Ozawa</td>
<td>1982 J. Chiu</td>
</tr>
<tr>
<td>1979 D. Dollimore</td>
<td></td>
</tr>
</tbody>
</table>
# NATAS Previous Award Recipients

<table>
<thead>
<tr>
<th>Year</th>
<th>NATAS Fellows</th>
<th>Year</th>
<th>NATAS Fellows</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>A. Toda</td>
<td>1998</td>
<td>H. Friedman</td>
</tr>
<tr>
<td>2014</td>
<td>C. Li</td>
<td>1997</td>
<td>W.-P. Pan</td>
</tr>
<tr>
<td>2013</td>
<td>M. Kessler</td>
<td>1996</td>
<td>I. Goldfarb</td>
</tr>
<tr>
<td>2012</td>
<td>R. Ozao</td>
<td>1995</td>
<td>L. Whiting</td>
</tr>
<tr>
<td>2011</td>
<td>C.-M. Shu</td>
<td>1994</td>
<td>J. Oxley</td>
</tr>
<tr>
<td>2010</td>
<td>D. J. Burlett</td>
<td>1993</td>
<td>S. Cheng</td>
</tr>
<tr>
<td>2009</td>
<td>None</td>
<td>1992</td>
<td>A. Riga</td>
</tr>
<tr>
<td>2008</td>
<td>E. L. Charsley</td>
<td>1991</td>
<td>M. Jaffe</td>
</tr>
<tr>
<td></td>
<td>P. Cebe</td>
<td>1990</td>
<td>R. Chartoff</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>J. Seferis</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>R. Blaine</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1989</td>
<td>B. Howell</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>J. Menczel</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>S. L. Simon</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1988</td>
<td>M. Keating</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>C. M. Neag</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1987</td>
<td>S. Vyazovkin</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>S. Brown</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1986</td>
<td>P. Vyazovkin</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>C. E. Schick</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L. C. Thomas</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1985</td>
<td>M. Reading</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1984</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1983</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1982</td>
<td>M. Keating</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>C. M. Neag</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>S. Brown</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1981</td>
<td>M. Brown</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L. Mandelkern</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>R. B. Prime</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1980</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>K. Lavanga</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>H. Friedman</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1979</td>
<td>W.-P. Pan</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>I. Goldfarb</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L. Whiting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1978</td>
<td>R. Seyler</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>J. Oxley</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1977</td>
<td>J. Harrison</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>P. Ronco</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1976</td>
<td>S. Cheng</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A. Riga</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1975</td>
<td>M. Jaffe</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>R. Chartoff</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1974</td>
<td>J. Seferis</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>R. Blaine</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1973</td>
<td>B. Howell</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>J. Menczel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1972</td>
<td>M. Jaffe</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>R. Chartoff</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1971</td>
<td>J. Seferis</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>R. Blaine</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1970</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>K. Lavanga</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1969</td>
<td>H. Friedman</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>W.-P. Pan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1968</td>
<td>I. Goldfarb</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L. Whiting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1967</td>
<td>R. Seyler</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>J. Oxley</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1966</td>
<td>J. Harrison</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>P. Ronco</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1965</td>
<td>S. Cheng</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A. Riga</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1964</td>
<td>M. Jaffe</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>R. Chartoff</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1963</td>
<td>J. Seferis</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>R. Blaine</td>
</tr>
</tbody>
</table>
2016 ICTAC Conference Sponsors

The following sponsors are gratefully acknowledged for their financial support of the 2016 ICTAC Conference.

Mettler - Toledo

Netzsch Instruments

SETARAM Instrumentation

TA Instruments

Hitachi High-Technologies America

The Lubrizol Corporation

TAFDV

Bruce Prime

Andrew McGhie
ICTAC Officers

President
ING. WIM DE KLERK
The Netherlands
TNO

Secretary
PROF. RANJIT VERMA
India
Patna University

Treasurer
DR. PIERRE LE PARLOUER
France
Retired (SETARAM)

Membership Secretary
DR. JUNKO MORIKAWA
Japan
Tokyo Institute of Technology

Guest of the Executive – Webmaster
DR. WOLF-ACHIM KAHL
Germany
University of Bremen

Past-President
DR. DON BURLETT
USA
Retired (Gates Corp.)

ICTAC Advisory Board

PROF. JEAN ROUQUEROL
France
MADIREL, Aix Marseille Université - CNRS

PROF. CSABA NOVAK
Hungary
Budapest University of Technology and Economics
Institute of General and Analytical Chemistry

PROF. EDER CAVALHEIRO
Brazil
Universidade de São Paulo
Instituto de Química de São Carlos

PROF. ROSA NOMEN
Spain
Institut Químic de Sarrià
NATAS Officers & Councilors

President
CHRIS LI
Drexel University
3141 Chestnut Street
Philadelphia, PA 19104
215-895-2083
cyl24@drexel.edu

Vice President (President-Elect)
QUEENIE KWOK
NRCan Canadian Explosives Research Laboratory
Bells Corners Complex – Building 12
1 Haanel Drive
Ottawa, Ontario
Canada K1A 1M1
613-996-7979
qkwok@nrcan.gc.ca

Secretary
HOLLY SALERNO
Dupont Experimental Station
200 Powder Mill Road
Wilmington, DE 19803
302-695-7264
holly.s.salerno@dupont.com

Treasurer
STEVE SAUERBRUNN
University of Delaware
Center for Composite Materials
Newark, DE 19716-3144
302-831-6692
Cell: 302-545-5895
Fax: 614-985-9094
sauerbru@udel.edu

Executive Councilor
PEGGY CEBE
Tufts University
574 Boston Ave., Room 412 J
Medford, MA 02155
617-627-3365
peggy.cebe@tufts.edu

Education Councilor
JANIS MATISONS
Gelest Inc.
11 Eastg Steel Road
Morrisville, PA 10967
215-547-1015 Ext. 307
jmatisons@gelest.com

Meetings Councilor
BOB HOWELL
Applications in Polymer Science, DW 263
Central Michigan University
Mount Pleasant, MI 48858
Phone: 989-774-3582
Fax: 989-774-3882
bob.a.howell@cmich.edu

Publications Councilor
ELIZABETH PELCZAR
Innophos, Inc
259 Prospect Plains Road
Cranbury, NJ 08512
609-366-1288
Elizabeth.pelczar@innophos.com

Ex Officio – AEC Representative
GREG JEWELL
P.O. Box 4961
Louisville, KY 40204
502-456-1851 x1
info@natasinfo.org
NATAS Committee Chairs

**Academic Liaison**
MICHAEL KESSLER
Iowa State University
Department of Materials Science and Engineering, 2220 Hoover Hall
Ames, IA 50011
Phone: 515-294-3101
Fax: 515-294-54444
mkessler@iastate.edu

**Awards**
ANDREW MCGHIE
University of Pennsylvania
The Laboratory for Research on the Structure of Matter
3231 Walnut Street
Philadelphia, PA 19104-6202
215-898-6461
mcghie@lrsm.upenn.edu

**Education**
BOB HOWELL
Central Michigan University
Applications in Polymer Science
DW 263
Mt. Pleasant, MI 48859
Phone: 989-774-3582
Fax: 989-774-3883
bob.a.howell@cmich.edu

**ICTAC Representative**
BOB HOWELL
Central Michigan University
Applications in Polymer Science, DW 263
Mount Pleasant, MI 989-774-3582
bob.a.howell@cmich.edu

**Local Sections**
SUBHASH C. MOJUMDAR
519-896-1929
scmojumdar@yahoo.com

**Membership**
HOLLY SALERNO
Dupont Experimental Station
200 Powder Mill Road
Wilmington, DE 19803
302-695-7264
holly.s.salerno@dupont.com

**Bylaws**
PEGGY CEBE
Tufts University
Science and Technology Center Room #208
Medford, MA 02155
617-627-3365
peggy.cebe@tufts.edu

**Photographer/Historian**
ALAN RIGA
TechCon Inc.
6325 Aldenham Drive
Cleveland, OH 44143-3331
440-391-0008
alanriga@sbcglobal.net

**Vendor Relations**
TINA ADAMS
The Lubrizol Corporation
29400 Lakeland Boulevard
Wickliffe, OH 44092
440-347-8509
tina.adams@lubrizol.com

**Volunteers**
Christopher Li
Drexel University
3141 Chestnut Street
Philadelphia, PA 19104
215-895-2083
cyl24@drexel.edu

**Website / Database**
AEC Management Resources
P.O. Box 4961
Louisville, KY 40204
Phone: 502-456-1851 x1
info@natasinfo.org

**Publicity/Marketing**
LINK BROWN
SETARAM Inc
8430 Central Avenue, Suite C
Newark, CA 94560
510-793-3345
link.brown@setaram.com

**Long Range Planning**
Vacant
2016 ICTAC Conference Committee

Conference Chair
TINA ADAMS
The Lubrizol Corporation
29400 Lakeland Boulevard
Wickliffe, OH 44092
Phone: 440-347-8509
tina.adams@lubrizol.com

Conference Co-Chair
BOB HOWELL
Applications in Polymer Science, DW 263
Central Michigan University
Mount Pleasant, MI 48858
Phone: 989-774-3582
Fax: 989-774-3882
bob.a.howell@cmich.edu

Technical Program Chair (North America)
ERIC SCHOCH
Materials and Processes
Northrop Grumman Mission Systems
1745A West Nursery Rd. Mailstop Z-18
Linthicum, MD 21090
Phone: 410-765-1362
Fax: 844-888-2473
k.eric.schock@ngc.com

Technical Program Chair (Asia)
RIKO OZAO
SONY Institute of Higher Education
No. 428, Nurumizu
Atsugi, Kanagawa 243-8501
Japan
Phone: +81-46-247-3131
Fax: +81-462-50-8936
ozao@shohoku.ac.jp

Technical Program Chair (Europe)
CRISAN POPESCU
Kao Germany GmbH
Pfungstädterstr. 98-100
Darmstadt, Hessen D-64297
Germany
Crisan.Popescu@kao.com

Conference Vice Chair for Exhibits
TINA ADAMS
The Lubrizol Corporation
29400 Lakeland Boulevard
Wickliffe, OH 44092
Phone: 440-347-8509
tina.adams@lubrizol.com

Conference Proceedings Chair
ELIZABETH PELCZAR
Innophos, Inc.
259 Prospect Plains Road, Building A
Cranbury, NJ 08512
Phone: 609-366-1288
Fax: 609-860-0138
Elizabeth.Pelczar@Innophos.com
ABSTRACT

Pyrotechnic systems are typically based on mixtures of finely divided fuels, such as boron, magnesium or titanium, with inorganic oxidising agents including metal oxides, nitrates and perchlorates. For certain types of composition organic binders are also added. The compositions are designed to burn at a controlled rate without requiring atmospheric oxygen and have many uses including flares and timing devices.

A wide range of thermal methods have been used in our work in order to characterise the reactivity and reaction mechanisms of pyrotechnic systems and their components [1]. For experiments under ignition conditions, where the sample undergoes a combustion reaction, specialised equipment has been developed to avoid the potential damage due to the force of the ignition and attack from high temperature reaction products. Although DTA and DSC have been the techniques most widely used to study pyrotechnic systems, it will be shown that valuable information can also be obtained using other thermal analysis techniques including thermomicroscopy, modulated temperature DSC and evolved gas analysis. In addition, the recent development of a sample controlled DSC system has extended the benefits of the sample controlled approach to pyrotechnic compositions that react without change in mass [2].

A number of pyrotechnic compositions can degrade during storage, resulting in a change in the performance and ultimately in failure to function. Isothermal microcalorimetry has proved to be a valuable technique to study directly the ageing process and the value of using thermal analysis and chemical analysis in conjunction with this technique will be illustrated by studies on systems based on mixtures of magnesium powder with inorganic nitrates [3].

Acknowledgements

I would like to express my most sincere thanks to ICTAC for honouring me with the 2016 Robert Mackenzie Memorial Lectureship. I would also like to acknowledge the considerable contributions of Dr T.T. Griffiths (QinetiQ Ltd), the late Dr B. Burger (Armasuisse), Dr I.M. Tuukkanen
(Finnish Defence Research Agency) and Prof P.G. Laye, Mr J.J. Rooney and my colleagues at the University of Huddersfield.

References

Advanced Kinetics of Thermally-Induced Heterogeneous Processes by Local Linear Procedures

Andrei Rotaru
INFLPR Bucharest – National Institute for Laser, Plasma and Radiation Physics, Laser Department
Bvd. Atomistilor, Nr. 409, PO Box MG-16, RO-077125 Măgurele
Bucharest, Romania

ABSTRACT

The TKS-SP software package [1,2] contains a multitude of possibilities for performing the kinetic analysis of various thermally induced processes that are monitored by thermal analysis equipment: from almost every type of isoconversional methods to the Invariant Kinetic Parameters (IKP) method [3], Perez-Maqueda et. al. criterion [4] and Master plot methods [5] following a combined procedure [6].

Recently reported, the advanced linear local kinetic methods of Tang&Chen [7] and Ortega [8] consider the activation energy to be constant on a certain range of conversion degree (the temperature integral is defined on a fixed interval of conversion degree). However, the first model-free kinetic method of this type was proposed by Popescu [9], but it is an isothermic linear method rather than an isoconversional linear one; later, Vyazovkin [10] has proposed the same procedure for an isoconversional method, but this time of non-linear type.

Tang&Chen method [7] is the first isoconversional linear local method that takes into account the “recent history” of the investigated process and also its “very next future”. The integration is done for each value of the conversion degree (\(\alpha\)), between (\(\alpha-\Delta\alpha\)) and (\(\alpha+\Delta\alpha\)), while Ortega method [8], based on similar assumptions, sets as integration limits: (\(\alpha-\Delta\alpha\)) and (\(\alpha\)). Thus, Ortega method takes into account only the „recent history” of the process. For very small values of \(\Delta\alpha\) (and also for very small values of \(\Delta t\)), Ortega method approximates

\[
\int_{\alpha-\Delta\alpha}^{\alpha} \frac{E_a}{RT(t)} dt \approx \Delta t \cdot e^{\frac{E_a}{RT(t)}}
\]

For \(\Delta\alpha \to 0\), when using simulated data, these methods provide activation energies identical to those obtained by Vyazovkin [10] and Friedmann [11] methods, while when using real data, they are only similar to Vyazovkin method and very close to Friedmann [11] method [12,13]. For \(\Delta\alpha > 0.05\), these methods actually average the evaluations on small restricted intervals of \(\alpha\), therefore they represent an adjustment of Friedmann method by using integral conversion data and eliminating the amplified errors that come out by their numerical derivation.
Rewriting the corresponding equations of Tang&Chen [7] and Ortega [8] methods may lead to the possibility of using them as single-heating rate methods and further as part of IKP procedure [3] and Perez-Maqueda et al. criterion [4] for the evaluation of the kinetic parameters [14].

References

ABSTRACT

Since the start of my scientific career in the mid-seventies, I have performed studies of crystallization, melting and morphology of metastable semi-crystalline polymer systems in relation to their macromolecular structure with an emphasis on quantitative thermal analysis & calorimetry.

Thermal analysis at that time was at its infancy: reasonable-working DSC’s had been introduced in the market but their running and the evaluation of results could not be done in an efficient way. We set our goals to realize quantitative measurement by DSC of heat capacities as function of temperature in order to provide the basis for determination of thermodynamic properties of polymer systems as function of temperature.

The pioneering DSC work of researchers like Wunderlich, Richardson, Gray, Höhne was crucial, and in combination with improved instruments developed by various companies in the 80’s it became possible – even in industry – to perform quantitative thermal analysis within an acceptable period of time and with a sound thermodynamic basis. The development of the ATHAS databank for (bio) macromolecules was a great achievement because it enabled to link calculated thermodynamic (fixed) reference functions for the fully amorphous state and the fully crystalline state to results from daily measurements showing the kinetics of all kinds of processes, reflecting the intrinsic metastability of the systems as function of temperature and time [1].

At that time [2] the various approximations of the heat of fusion, \( \Delta h(T) \), and of the driving force of crystallization, \( \Delta g(T) \), being standardly used in crystallization studies should have been replaced by the ATHAS databank data. Even nowadays this is still not generally the case. With the coming of Fast Scanning Calorimetry (FSC) [3] this item is even more of importance because for the first time in history the capability to cool and heat extremely fast is now open to everyone, which discloses areas of research hitherto impossible to reach. Especially measuring at high supercoolings as well as quenching into an amorphous state at a constant rate are possible now. At these high supercoolings the temperature dependence of the thermodynamic functions is even more of importance.
Evaluation of data within the right context (e.g. reference states) is one thing; measuring under relevant conditions another. As one can imagine it is very difficult and sometimes misleading to advise on a process running at 100 °C/s on the basis of DSC results obtained at 10 °C/min. The ability to operate at the same rate as that of the process (or any other relevant rate) is one of the benefits FSC brings to the family of calorimeters by its tremendous increase of the high end of the scan-rate range, now spanning 10 orders of magnitude. Very interesting also, is the fact that FSC links up with the timescale of Monte Carlo simulations.

In conclusion, the capability of study of metastability of materials and of thermal properties - not only of polymers but also of metals, pharmaceutics etc. - by DSC techniques and methods has been increased tremendously in recent years.

References

Executive Coach – Plenary Lecture  
Tuesday August 16, 2016  
1:40 – 2:40 pm  
Swan Ballroom

Neurobiology, Thermodynamics, and Happiness, Oh My! How to Engage Your Somatic Systems in the Face of Entropy and Stress

Jim Smith  
The Executive Happiness Coach®  
Jim@TheExecutiveHappinessCoach.Com  
www.TheExecutiveHappinessCoach.com

ABSTRACT

My high school science teacher had two mantras: “Chemistry is Life!” and “Scientia potentas est” (Latin: Knowledge is power). I promptly forgot that wisdom when I left for college, but years later I heard his voice in my head during a hands-on demonstration of neurobiology at, of all things, a coaching conference. Mr. Mayer was right – chemistry is the stuff of life, and knowledge of how it works gives one the power to make different choices in life.

Nearly everything that you feel or do ties back to that wonderful electro-chemical device we affectionately call grey matter: our brain. You were all born with an operating system fully loaded with physical, emotional, and intellectual capacity. Our educational systems tend to specialize, however, so many of you have nurtured those capacities in isolation, e.g. growing your mind in the classroom, your body in sports, and your heart on your own time.

But guess what? You are still only ONE operating system; anything you do in one area affects the others. Your conference organizers invited me to create a program to support you in managing the often-conflicting priorities in your life and work, and finding points of balance in the midst of a crazy busy world, through the intersection of chemistry and coaching.

I propose to do so by reminding you of the great power you already hold – the power to pay attention, the power to choose, and the power to use your whole self as an integrated system.

What’s this got to do with Happiness? Join us after lunch on Tuesday to learn more.

I invite you to attend this session with an open mind and a willingness to engage. Bring your scientific curiosity and observe what happens when you experiment with YOU.

As participants in this session you will:

• Explore the value of Positive Emotions in work, life, and the lab
Better understand the Ontological framework that describes human behavior
Learn how your body uses heat to ignite action – or not
Experiment with heat-reduction tools to lower stress or change a conversation
Learn how to leverage the Mind-Body connection to improve your relationships, increase Personal Presence, and change personal habits

Jim Smith, The Executive Happiness Coach® is a global provider of executive coaching, and personal and workplace transformation services.

My passion is to create a Happier world and workplace, one Leader at a time.

He has a ton of experience and certifications and credentials, such that he could string 49 letters after his name. Big whoop. What you really want to know is, “will he keep me awake after lunch?” Yes.
Finally, Jim wants you to know that he worships the forces of Darkness—Dark Coffee, Dark Beer, and Dark Chocolate—and deeply believes that Happiness is a Decision, not an Event!
Thermal Analysis in Biological and Medical Applications

Dénes Lőrinczy
Department of Biophysics School of Medicine
University Pécs
denes.lorinczy@aok.pte.hu

ABSTRACT

In this presentation I will sum up our research activity from this field performed in the last about 25 years. I will focus on three main points: basic muscle research in the different intermediate states of ATP hydrolysis cycle during muscle contraction, R&D activities to develop and test different dairy products and TA application in some surgical and diagnostic problem.

Our initial research concerned the investigation of thermal stability of main muscle proteins when their basic unfolding characteristics was clarified. Our first paper discussed the conformational changes in bovine heart myosin studied by EPR and DSC. It was followed by the skeletal G and F-actin, and we extended the thermal stability investigation from protein solution to the myosin myofibrils, checking the effect of nucleotides.

The next step was to go to the higher organization of muscle proteins, the muscle fibers. At that time became possible to stabilize the different intermediate states of ATP hydrolysis up to the time of DSC measurement. At very first we checked the effect of oxygen free radicals in myosin head. It was continued with muscle fibers using different P₁ analogues (Vᵢ, AlF₃ and BeF₃) and non-hydrolysable ATP analogue (AMP.PNP). Our biggest success was to prove at very first that the AM.ADP and rigor states differ from each other not only from biochemical but internal molecular dynamic point of view too [1,2]. We have got further help for the interpretation of these states from the studies of cooperative stabilization of actin filaments by phallolidin and

With our R&D cooperation a cold spreadable butter was successfully developed. We were a partner in the development of Ca-enriched cheese, in its spreadable form too as well as in the development and testing of different dairy product using probiotic cultures.

Our TA activity covers a wide range of medical applications medicine. We could follow by TA the different abnormalities of human leg skeletal muscle. We have found a good agreement between the DSC scans and different stages of degeneration of human vertebral disc. We could judge the goodness/applicability of different suture technique on tracheal cartilage in primary airway
reconstruction. TA was successfully used in the characterization of different self-expandable stents implantation in the oesophagus treatment. We could monitor the effect of shoulder arthroscopic capsullography by DSC. We investigated the thermal consequences of tendon and ligament rupture of leg. We have joined those groups [4] who try to use DSC in the diagnosis of different diseases from blood plasma e.g. in case of breast cancer, melanoma as well as in psoriasis.

References
Melting Kinetics of Polymer Crystals Examined by Fast-Scan DSC

Akihiko Toda
Hiroshima University
atoda@hiroshima-u.ac.jp

ABSTRACT

Melting of polymer crystals has been examined by thermal analysis of conventional and fast-scan DSC, utilizing the heating rate dependence of the shift in melting peak temperature. The melting point extrapolated to zero heating rate (zero-entropy-production melting point) represents the equilibrium melting point of chain-folded lamellar crystals in equilibrium with surrounding melt. Combining the melting point determined and the lamellar thickness obtained by small angle X-ray scattering (SAXS), the Hoffman-Weeks and Gibbs-Thomson plots of the melting points are utilized for the determination of the equilibrium melting point of chain-extended infinite-size crystal. The emphasis of the present contribution is on the remarkable reorganization of lamellar structure during isothermal crystallization process examined by both of fast-scan DSC and SAXS.
How Thermal Analysis Helped Define and Solve Major Industrial Collaborative Programs as well as the use of TMDSC in Distinguishing Between the Hydrophobic and Hydrophilic Forces

Janis Matisons
Gelest Inc.
jmatisons@gelest.com

ABSTRACT

The talk will consist of two parts. In the first I will review how thermal analysis was used across various industry-academic collaborative projects in establishing an Australian national center for materials research. Interesting examples of thermal analysis in several areas of nanotechnology and polymer chemistry will be highlighted from a historical perspective.

In the second I will focus on a particular academic research program and how thermal analysis was used to distinguish between the hydrophobic and hydrophilic forces resident in self-assembling amphiphilic molecules. Here five amphiphilic lipids were self-assembled in aqueous dispersions into high axial ratio nanostructures. The morphologies of these aggregates included high axial ratio nanostructures, such as nanotubes; and flat, twisted, and helical ribbons, which reveal complex and intriguing thermal behavior by DSC. Thermal analysis was conducted on these glycolipids that self-assembled into nanotubes, showing a dry melting onset of 148.2 °C to be defined as well as evidence of a highly ordered supramolecular structure. The use of TMDSC in resolving hydrophobic versus hydrophilic associations in these structures will be discussed.
Sunday August 14, 2016

Welcome Reception, Exhibition and Poster Sessions

6:00 to 8:30 PM
Swan Ballroom and Foyer

General Poster Session

Prepared Polymer Drug Formulations by Melt Extrusion and Studied Interactions by Thermal Analysis

**D. Bikiaris** (Aristotle University of Thessaloniki)  
P-1

Thermal Degradation of Biobased Polyesters: Decomposition Mechanism of Polyesters from 2,5-Furandicarboxylic Acid and Various Aliphatic Diols

**D. Bikiaris** (Aristotle University of Thessaloniki)  
P-2

Thermal Properties of HA/PEO Nanofibrous Blends for Biomedical Applications

**D. Smeikalova** (Contipro Pharma), **A. Kotzianova**, **J. Rebicek**, **O. Zidek**, **M. Pokorny**, **J. Kucerik**, **V. Velebny**  
P-3

Biobased/biodegradable Copolyesters for Food Packaging: Thermal Properties of Poly(ethylene furanoate-co-ethylene succinate)

**D. Bikiaris** (Aristotle University of Thessaloniki)  
P-4

Polysters Synthesized from Monomers from Renewable Sources Synthesis, Crystallization and Melting of Poly(alkylene furanoate)s

**D. Bikiaris** (Aristotle University of Thessaloniki)  
P-5

Thermal Study of PF Resins with Microalgae Biomass

**E. Papadopoulou** (CHIMAR HELLAS SA), **K. Chrissafis**  
P-6

Exploring Protein Stability and Aggregation by nanoDSF

**W. Strutz** (NanoTemper Technologies, Inc.), **E. Lee**  
P-7

Rapid Screening of Biomolecular Interaction Utilizing Automated Isothermal Titration Calorimetry

**P. Vaitiekunas** (TA Instruments)  
P-8

TAM IV Applications in Pharmaceuticals and Life Sciences

**P. Vaitiekunas** (TA Instruments)  
P-9

Homo- and Heterobimetallic Complexes Ferrocene-type with Potential Applications as Burning Rate Catalysts in Solid Propellants

P-10

* Keynote Speaker
Thermal Decomposition Reaction Mechanism of Ammonium Dinitramide (ADN)
Y. I. Izato (Yokohama National University), H. Habu, A. Miyake, M. Koshi  

TGA-FTIR-MS Used in Characterization of Propellants and Other Materials
C. t Hoen (TNO), E. Krabbendam – La Haye

Thermal Hazard Analysis of Corn Starch Explosion with Three Types of Extinguishing Agents
B. Laiwang (National Yunlin University of Science and Technology), S. J. Shen, C. P. Li, J. R. Chen  

Thermal Hazard Assessment on Inert Atmosphere for Lithium Ion Battery
Y. H. Chung (National Yunlin University of Science and Technology), W. C. Chen, Y. W. Wang, C. M. Shu

Thermal Properties of Trogamid by Conventional and Fast Scanning Calorimetry
P. Cebe (Tufts University), B. Mao, J. Merfeld, A. Wurm, E. Zhuravlev, C. Schick

Product Analysis for Snack Confectionery with Fragmentless Ionization Mass Spectrometry
T. Tsugoshi (NMIJ/AIST), Y. Mishima

Forensic Identification of Mechanical Pencil Leads by TG/DTA with Optical Observation
Y. Nishiyama (Hitachi High-Tech Science Corporation), Y. Kasai, M. Iwasa, B. Gooolsby, K. Shibata

Thermal Behavior of Modified Asphalt Binder with Industrial Residue
D. da Graça (UFRJ), C. Mothe, G. Cardoso

Cold Flow Additives: A Thermal and Microscopic Study
R. Kovach (The Lubrizol Corporation), T. Adams

Influence of Antioxidant on the Thermal Properties of Oil Contained Substances
A. Miyake (Yokohama National University)

Thermal Processing Assessment of Binders Asphalt with Modifiers Agents
C. Mothe (Federal University of Rio de Janeiro), M. Mothe, L. A. Nascimento, C. Gomes da Cruz

Thermal Stability Analysis of Tea Tree Essential Oil by DSC and TG
B. Laiwang (National Yunlin University of Science and Technology), W. T. Chen, Y. T. Tsai, W. C. Chen, S. J. Shen, M. L. You

Decomposition Comparison Tests for Essential Oil from Different Sources at Different Scanning Rates by DSC
C. M. Shu (National Yunlin University of Science and Technology), W. T. Chen, H. W. Chen, C. M. Ma, S. J. Shen

Thermal Hazard and Explosive Analysis of Solid Powder Ionic Liquid
C. M. Shu (National Yunlin University of Science and Technology), S. Y. Huang, S. H. Liu, H. Y. Hou, W. C. Lin

* Keynote Speaker 31
Evaluation of Explosive Properties Between Colored Cornstarch and Cornstarch
Y. H. Chung (National Yunlin University of Science and Technology), J. R. Chen, C. P. Li, C. R. Cao, S. J. Shen, J. R. Lin

Kinetic Analysis of Partially Overlapping Thermal Decomposition and Carbothermal Reduction During Heating AgCO3–graphite Mixtures
T. Fujiwara (Hiroshima University), M. Yoshikawa, N. Koga

Evaluation of Thermal and Mechanical Stability of Chitosan/clay Nanocomposites Films
C. Cavalheiro (Instituto de Química de São Carlos - USP), V. Gonzaga, J. Gabriel, A. Poli

Effect of Silver Nanoparticles/clays on Photopolimerization Kinetics of HEMA/EGDMA using Photo-DSC
C. Cavalheiro (Instituto de Química de São Carlos - USP), P. Lombardo, A. Poli

Studies on Fluoxetine Thermal Degradation Mechanism
E. Cavalheiro (Universidade de São Paulo), B. Pinto, A. Ferreira

Thermal Analytical Studies of Carvedilol
E. Cavalheiro (Universidade de São Paulo), R. Castro, A. Ferreira, R. Gallo

Kinetic Analysis of Phenolic Resin Blends
K. C. G. Candidoto (EEL-USP), G. Marins, C. Shigue

Thermolysis, Nonisothermal Decomposition Kinetics and Safety Assessment of Dihydroxyammonium 5, 5′-Bistetrazole-1, 1′-diolate
Q. Shu (Beijing Institute of Technology), S. Jin, H. Niu, S. Chen

Study of UAl2/Al Reaction by Stepwise Isothermal Dilatometry
T. Restivo (UNISO), M. Durazzo, G. Conturbia, A. Moreira, E. Urano de Carvalho, H. Riella

Multistep Kinetic Features of Thermal Degradation of Poly(Lactic Acid) Oligomer
N. Kameno (Hiroshima University), S. Yamada, T. Animoto, K. Animoto, H. Ikeda, N. Koga

M. Tachikawa (Yokohama City University)

Effect of Cooling Rates on Crystallization Kinetics of a Semiconducting Glassy Alloy
D. Sharma (WIT), R. Shukla, A. Kumar

Individual Kinetic Parameters for Thermal Decomposition of the Magnesium Stearate
C. A. Ribeiro (Instituto de Química/UNESP), J. M. V. Capela, M. V. Capela

Effect of Nanosilica on the Performance Behavior of Acrylic Copolymers
D. Patsiaoura (Aristotle University of Thessaloniki), C. Koukiotis, E. Pavlidou, D. Bikiaris, K. Chrissafis

Synthesis and Morphological and Thermal Characterization of PVDF/Zeolite Nanocomposite Membranes
L. Malmonge (UNESP - Univ Estadual Paulista), L. Zadorosny, J. Malmonge, M. Santos
Synthesis, Characterization and Thermal Investigation of PVDF/Clay Nanocomposite Membranes
M. Santos (UNESP - Univ Estadual Paulista), L. Faria, L. Zadorosny, L. Malmonge P-40

Polyhedral Oligomeric Silsesquioxanes (POSSs): A Thermal Stability Scale
I. Blanco (University of Catania), F. A. Bottino P-41

Preparation of Activated Carbons for Storage of Methane and Its Study by Adsorption Calorimetry
J. C. Moreno-Piraján, (Universidad de los Andes), L. Giraldo, M. Bastidas-Barranco P-42

Thermal and Mechanical Characterization of Wood-plastic Composite
B. Bezerra (UNESP), R. Battistelle, N. Viola, G. Perpétuo P-43

Thermal, Physical and Mechanical Characterization of Sugarcane Bagasse Particleboards for Civil Construction
B. Bezerra (UNESP), R. Battistelle, D. Mika Fujino, I. Valarelli, R. Turra Alarcon P-44

Analysis of Water State and Gelation of Methylcellulose Thermo-Reversible Hydrogel
Y. Nishimoto (Kanagawa Univ.) P-45

Important Factors for the Formation of a Stable Inclusion Complex Between Catechins and Cyclodextrins
T. Ohata (Fukuoka University), H. Ikeda, M. Yukawa, M. Inenaga, H. Aki P-46

Environmental Consciousness in Japan and Application of Thermal Analysis - Data-mining using Eco-MCPS, a Web-database for Ecomaterials and Products
R. Ozao (SONY Institute of Higher Education), T. Utsumi, T. Ishii, Y. Shinohara, K. Halada P-47

Studying the Thermal Decomposition of Chitosans with Different Deacetylation Degrees by Coupled TG-FTIR
E. Cavalheiro (Universidade de São Paulo), A. Ferreira, H. Barbosa P-48

Thermogravimetry, a Powerful Tool for Analyzing and Modelling of Soil Properties
J. Kucerik (University of Koblenz-Landau), D. Tokarski, C. Siewert P-49

Thermal and Physical Analyses of MDP Panels Made with Residues of Bamboo and Coconut Fibers
F. Dinhane (UNESP), I. Valarelli, B. Bezerra, R. Battistelle, M. Bueno P-50

Specific Heat Capacity Measurement of Thermal Insulation Material by Differential Scanning Calorimeter
H. Abe (National Metrology Institute of Japan (NMIJ), AIST), M. Akoshima, T. W. Lian, A. Kondo, M. Naito P-51

Viability of Energy Application from Waste Generated, After the Process of Dewatering and Thermal Drying, in Wastewater Treatment Plant (WWTP).
S. Almeida (UNESP), W. Nozela, L. Torquatro, C. Braz, M. Crespi P-52

Study of the Thermal Behavior of Pittosporum Undulatum
M. Crespi (UNESP), M. Kobelnik, G. Fontanari, C. A. Ribeiro P-53

* Keynote Speaker
Elucidation of Physical Incompatibility Between Antipsychotic Aripiprazole and Polyphenol Contained in Tea-based Beverage
H. Ikeda (Fukuoka University), S. Takahashi, T. Ohata, M. Yukawa, M. Fujisawa, H. Aki

Prediction of Thermodynamic Functions of Solvation by Dispersion-corrected Density Functional Theory Calculations
H. Ikeda (Fukuoka University), T. Ohata, M. Yukawa, H. Aki, T. Kimura, M. Fujisawa

Addition Effect of Cyclodextrin on Interaction Between Antipsychotic Aripiprazole and (-)-Epigallocatechin Gallate
H. Ikeda (Fukuoka University), Y. Arikawa, A. Iwasaki, S. Takahashi, T. Ohata, M. Yukawa, M. Fujisawa, H. Aki

Thermal and Chemical Stability of New Sunscreens
A. Almeida (Faculdade de Ciências Farmacêuticas), J. Reis, M. Reis, J. Alonso, J. Oliveira, C. A. Ribeiro, R. Peccinini, J. Santos

Thermal Analysis of Enalapril Maleate
E. Cavalheiro (Universidade de São Paulo), A. Ferreira, M. Souza

Thermal Analytical Study of Losartan Potassium by TG/DTG, DSC and FTIR
C. Araujo (UFRJ), M. Mothe, C. Mothe

Case Study for the Storage Assessment of 1-Bromoethyl Ethylcarbonate
D. Bill (Pfizer)

Time Degradation of Rubber Bands by TG/DTA with Optical Observation
M. Iwasa (Hitachi High-Tech Science Corporation), Y. Kasai, S. Nishimura

Thermal Stability of Drilling Fluids
C. Mothe (Federal University of Rio de Janeiro), N. Giesbrecht, M. A. M. Oliveira

The Activities in Japan to Develop Thermal Analysis Standards and Standards Methods
Y. Nishimoto (Kanagawa Univ.)

Education of Thermal Analysis: Activity of the Working Group on Standardization in JSCTA

Thermal Properties of Solidus and Liquidus Phase of 2-Butanol + Butylamine Isomers
Y. Kasai (Hitachi High-Tech Science Corporation), M. Fujisawa, T. Kimura

* Keynote Speaker
Student Poster Session

Thermal Analytical Study of Bio Keratin Extracted from Industrial Residue

M. Mothe (Federal University of Rio de Janeiro), L. Viana, J. Chantre, C. Mothe

Influence of Sample Container Volume on the Thermal Behavior of Nitrocellulose/Acid Mixtures

S. Fukui (Fukuoka University), E. Higashi, H. Matsunaga, S. Kawaguchi, K. Katoh

Investigation of Sulfur and Selenium Vapors with Thermal Analysis – Single Photon Ionization Mass Spectrometry


Thermal Properties of Ionic Liquid 1-Buthyl-3-Methylimidazolium Chloride and Copper(II) Oxide Mixtures

K. Shiota (Yokohama National University), K. Wada, A. Miyake

Discovering the Thermal Decomposition on Continuous Cooling

T. Liavitskaya (University of Alabama at Birmingham), S. Vyazovkin

Isoconversional Kinetics of Nonisothermal Crystallization of Salts From Solutions

V. Stanford (University of Alabama at Birmingham), S. Vyazovkin, C. McCulley

Melting of Gelatin Gels Confined to Silica Nanopores

J. Prado (University of Alabama Birmingham), E. Kharlampieva, S. Vyazovkin, J. Chen

Thermal Decomposition and Combustion Behavior of Guanidine Nitrate/Basic Copper Nitrate Mixture

M. Nakashima (Fukuoka University), T. Itaura, H. Matsunaga, E. Higashi, S. Takagi, K. Katoh

Crystalline Layered Structure of Precision Halogen Substituted Polyethylenes measured by DSC, WAXD and FTIR

X. Zhang (Florida State University), K. Wagener, E. Boz, R. G. Alamo

Molecular Weight Dependence of Thermodynamic Fragility for Amorphous Styrene Oligomer

E. Nishiyama (China Institute of Technology), J. Fujimura, M. Yokota, I. Tsukushi

Thermal Analysis of Electrospun Fibers of Poly(butylene terephthalate)

N. Govinna (Tufts University), P. Cebe

Study of Variation the Morphological Properties of Carbon Aerogel By Immersion Calorimetry

R. A. Fonseca Corre (Universidad de los Andes), J. C. Moreno-Piraján, L. Giraldo

Equilibrium Polymerization of Butyl Methacrylate in Bulk and in Nanopore Confinement

Q. Tian (Texas Tech University), S. Simon

* Keynote Speaker
Monday, August 15, 2016

Opening Ceremonies
Swan Ballroom
8:00 – 8:40 am
Wim de Klerk – ICTAC President
Chris Li – NATAS President

Plenary Lectures

Robert McKenzie Memorial Award
Swan Ballroom

8:40 - 9:40 am  Studies on Metal-Oxidant Pyrotechnic Systems Using Thermal Methods  PL-1
E. Charsley (University of Huddersfield)

ICTAC Young Scientist Award
Swan Ballroom

1:20 – 1:40 pm  Student Award Introductions

1:40 – 2:40 pm  Thermal Stability, Dynamics of Dipoles and Elastic & Anelastic Relaxations  PL-2
Accompanying the Relaxor Dielectric Behaviour of Tetragonal Tungsten Bronze Oxides: From Modelling to the Development of Novel Ferroelectrics and Further Design of Multiferroics  
A. Rotaru (INFLPR / CEEC-TAC)

* Keynote Speaker 36
Kinetics
Osprey 1

Sergey Vyazovkin – University of Alabama Birmingham
Nobuyoshi Koga – Hiroshima University
Jiri Malek – University of Pardubice

* 9:40 - 10:20 am  Multistep and Distributed Reactivity Models for Kinetic Analysis
A. Burnham (Stanford University)  KIN-1

10:20 - 10:40 am  Coffee Break

10:40 - 11:00 am  Actuals of Superficially Ideal Solid-state Reactions for Kinetic Analysis Using Thermal Analysis
N. Koga (Hiroshima University)  KIN-2

11:00 - 11:30 am  Why Reaction Rate Does Not Always Obey Arrhenius Law During Gas-solid Reactions?
L. Favergeon (Ecole des Mines), M. Pijolat  KIN-3

11:30 - 12:00 pm  The Incremental Isoconversional Method Revisited
T. Dubaj (Slovak University of Technology), P. Šimon  KIN-4

12:00 – 2:40 pm  Lunch Break and Plenary Lecture

2:40 - 3:00 pm  Secret Life of Chemicals. How to Explain and Verify by Double-Scan Test the Continuous Change of Their Thermal Behavior During Storage
B. Roduit (AKTS AG), M. Hartmann, P. Folly, A. Sarbach  KIN-5

3:00 - 3:20 pm  Discovering the Thermal Decomposition on Continuous Cooling
T. Liavitskaya (University of Alabama at Birmingham), S. Vyazovkin  KIN-6

3:20 - 3:40 pm  Coffee Break

3:40 - 4:00 pm  Melting of Gelatin Gels Confined to Silica Nanopores
J. Prado (University of Alabama Birmingham), S. Vyazovkin, E. Kharlampieva, J. Chen  KIN-7

4:00 - 4:20 pm  Non-isothermal Crystallization in Iron Phosphate Type Glasses: A Comparison
K. Joseph (Indira Gandhi centre for Atomic Research)  KIN-8

4:20 - 4:40 pm  Isoconversional Kinetics of Nonisothermal Crystallization of Salts From Solutions
V. Stanford (University of Alabama at Birmingham), S. Vyazovkin  KIN-9

* Keynote Speaker
4:40 - 5:00 pm  A Study of p-Xylylene Polymerization Kinetics Using In Situ Vacuum Differential Scanning Calorimetry  
D. Streltsov (Enikolopov Institute of Synthetic Polymer Materials, Russian Academy of Sciences), A. Buzin, P. Dmitryakov, S. Chvalun  

5:00 - 5:20 pm  Dielectric Relaxation Kinetics of a-Se_{90}In_{8}Ag_{2} Glassy Alloy  
D. Sharma (WIT), S. Sharma, R. Shukla, A. Kumar  

Materials Processing  
Pelican  
Michael Kessler, Washington State University (Session Chair)  

9:40 - 10:00 am  Investigation of Structure Formation in PA6 and Its Relation to the Glass Transition Temperature  
E. Parodi (TUEindhoven), G. Peters, L. Govaert  

10:00 - 10:20 am  In-situ X-ray Analysis During Flash DSC Experiments: Study of Isothermal Crystallization and Phase Transformation of Polyamide 12  
F. Paolucci (TUEindhoven), G. Peters, L. Govaert  

10:20 - 10:40 am  Coffee Break  

10:40 - 11:00 am  The Role of Thermal Analysis in the Invention (Recognition) of High Modulus Low Shrinkage Tire Cord  
M. Jaffe (New Jersey Institute of Technology)  

11:00 - 11:20 am  Ozone Reaction with Carbon Fiber by TGA  
S. Sauerbrunn (University of Delaware - CCM), J. Deitzel, M. Theissig  

11:20 - 11:40 am  Low Temperature Densification of Ceramics and Cermets by the Intermediary Stage Activated Sintering Method  
T. Restivo (UNISO), M. Durazzo, S. Mello-Castanho, A. Moreira, S. Graciano, V. Telles, J. Tenorio  

High Temperature Thermal Analysis  
Pelican  
Edward Gorzkowski – Naval Research Laboratory  
Ricardo Castro – University of California Davis (Session Chairs)  

* 2:40 - 3:20 pm  High Temperature Stability of Nanocrystalline Ceramics  
R. Castro (University of California, Davis)  

* Keynote Speaker 38
<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:20 - 3:40 pm</td>
<td>Coffee Break</td>
</tr>
</tbody>
</table>
| 3:40 - 4:00 pm      | Thermal Analysis of Metal Oxides with Ionic-electronic Conductivity for Thermochemical Energy Storage
                      | E. Coker (Sandia National Laboratories), S. Babiniec, A. Ambrosini, J. Miller                   |
| 4:00 - 4:20 pm      | Thermal Conductivity Retarded at Elevated Temperatures for nanocrystalline 7 wt% Yttria doped Zirconia (7YSZ) Processed via Two Step Sintering (TSS)
                      | J. Drazin (Naval Research Laboratory), E. Gorzkowski                                            |
| 4:20 - 4:40 pm      | Induced Thermal Hazard by Metal Dissolution in 1-Butyl-3-Methylimidazolium Nitrate by Three Calorimeters
                      | Y. H. Chung (National Yunlin University of Science and Technology), W. C. Lin, S. H. Liu, H. Y. Hou, C. M. Shu |
| 4:40 - 5:00 pm      | Determining Solidus and Liquidus Temperatures of Alloys with Large Supercooling                  |
                      | J. Gao (GE Global Research), A. Deal, M. Ravalli                                               |

**Instrumentation and Methods**

Osprey 2

Stanislov Stoliavou – University of Maryland
Kadine Mohomed – TA Instruments (Session Chairs)

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
</tr>
</thead>
</table>
| * 9:40 - 10:20 am   | Polymer Combustion Products at Constant Fuel/Oxygen Ratios
                      | R. Walters (Federal Aviation Amimistration), L. Speitel, R. E. Lyon                             |
| 10:20 - 10:40 am    | Coffee Break                                                                                     |
| 10:40 - 11:00 am    | Investigation of Ignition Due to Oxidative Decomposition by Using TG/DTA with Optical Observation
                      | B. Goolsby (Hitachi High Technologies, America), K. Shibata, Y. Nishiyama, H. Takahashi         |
| 11:00 - 11:20 am    | Estimation of Global Reaction Mechanisms of Ammonium Perchlorate using TGA-FTIR Spectroscopy
                      | N. Kumbhakarna (Indian Institute of Technology Bombay), A. Chowdhury, L. Mallick, S. Kumar     |
| 11: 20 - 11:40 am   | Thermoporometry, a Useful Tool in a wide range of applications
                      | J. Riikonen (University of Eastern Finland), E. Koudelkova, R. Bulanek, J. Töyräs, V. P. Lehto |

* Keynote Speaker
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker and Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:40 - 12:00 pm</td>
<td>Automatic Analysis of DSC and TG Curves</td>
<td><em>E. Moukhina (NETZSCH Geraetebau GmbH)</em></td>
</tr>
<tr>
<td>12:00 - 2:40 pm</td>
<td>Lunch break and Plenary Lecture</td>
<td></td>
</tr>
<tr>
<td>3:00 - 3:20 pm</td>
<td>Introduction to the Titration TGA Technique and Its Application to the Quantification of Evolved Argon From a Titanium Based Alloy</td>
<td><em>R. Andre (SETARAM Instrumentation), G. Lebourleux, C. Mayoux, F. Pavanello</em></td>
</tr>
<tr>
<td>3:20 - 3:40 pm</td>
<td>Coffee Break</td>
<td></td>
</tr>
<tr>
<td>3:40 - 4:00 pm</td>
<td>Investigation of Material Structure and Stability Using Modulated DSC</td>
<td><em>J. Saienga (TA Instruments)</em></td>
</tr>
<tr>
<td>4:00 - 4:20 pm</td>
<td>Accurate Heat Capacity Measurements on a Diverse Range of Materials by a Cp Direct Method</td>
<td><em>A. Levchenko (TA Instruments)</em></td>
</tr>
<tr>
<td>4:20 – 4:40 pm</td>
<td>Improvements to Vapor Pressure Measurements of Thermally and Oxidatively Sensitive Molecules by TGA/DSC</td>
<td><em>M. Roberts (Lubrizol), G. Cormack</em></td>
</tr>
</tbody>
</table>

**Personal Care**

**Mockingbird 1**

Denise Rafferty – Lubrizol (Session Chair)

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker and Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>* 9:20 - 10:20 am</td>
<td>Amorphous Form of coenzyme Q10 Loaded in Hyaluronan Polymeric Micelles for Improved Skin Penetration</td>
<td><em>D. Smejkalova (Contipro Pharma), J. Kucerik, V. Velebny</em></td>
</tr>
<tr>
<td>10:20 - 10:40 am</td>
<td>Coffee Break</td>
<td></td>
</tr>
<tr>
<td>10:40 - 11:00 am</td>
<td>Shaping Hair with Heat: Can Thermal Analysis Help?</td>
<td><em>C. Popescu (Kao Germany GmbH)</em></td>
</tr>
</tbody>
</table>

* Keynote Speaker
11:00 - 11:20 am  How Human Activities Can Affect Human Lungs and Breathing?  
*Keynote Speaker* 
D. Sharma (WIT), N. Calhoun  

11:20 - 11:40 am  Practical Applications of Thermal Analysis to the Study of Hair Fibers  
T. Adams (The Lubrizol Corporation), R. Kovach  

11:40 - 12:00 pm  Evaluation of Microstructural Change in Hair by Thermoporometry  
T. Habe (Kao Corporation), S. Inoue, C. Popescu, B. Noecker  

---

**Pharmaceuticals**  
Mockingbird 1  

Wenwen Huang – Tufts University  
Vesa-Pekka Lehto – University of Eastern Finland (Session Chairs)  

2:40 - 3:00 pm  Regulating Isothermal Crystallization of Pharmaceutical Glasses  
K. Kawakami (National Institute for Materials Science), S. Tominaka, M. Fukushima  

3:00 - 3:20 pm  Isothermal Microcalorimetry: A Vital Technique in Preformulation and Formulation of Probiotics  
C. Dodoo (University College London), P. Stapleton, A. Basit, S. Gaisford  

3:20 - 3:40 pm  Coffee Break  

3:40 - 4:00 pm  General Mechanism for the Thermal Decomposition of Tetracyclines  
E. Cavalheiro (Universidade de São Paulo), P. Cervini, A. Ferreira, B. Ambrozini, L. C. Murrell Machado  

4:00 - 4:20 pm  A Fast Thermodynamic Classification of Screening Hits Utilizing Automated Affinity ITC  
P. Vaitiekunas (TA Instruments)  

* *  

* Keynote Speaker
Tuesday, August 16, 2016

Plenary Lectures

TA Instruments ICTAC Award
Swan Ballroom

8:00 - 9:00 am Title: To Be Announced
V. Mathot

Executive Coach
Swan Ballroom

1:20 - 2:20 pm Neurobiology, Thermodynamics, and Happiness, Oh My! How to Engage Your Somatic Systems in the Face of Entropy and Stress
J. Smith (The Executive Happiness Coach)

Kinetics
Osprey 1

Sergey Vyazovkin – University of Alabama Birmingham
Nobuyoshi Koga – Hiroshima University
Jiri Malek – University of Pardubice

* 9:00 - 9:40 am Kinetic Analysis of Complex Solid-state Reactions
L. A. Perez-Maqueda (Institute of Materials Science of Seville (CSIC-Univ-Sevilla)) A. Perejón, P. E. Sanchez Jimenez, J. M. Criado

9:49 - 10:00 am Thermodynamic and Kinetic Study of MgSO4-H2O System for Heat Storage by a Composite
L. Okhrimenko (Centre SPIN, Mines Saint-Etienne), L. Favergeon, F. Kuznik, K. Johannes, M. Pijolat

10:00 - 10:20 am Themokinetic Analysis of Surface Coated CaCO3 with Nano-TiO2 Using Master Plot Method
C. Ghoroi (IIT Gandhinagar), S. Chandra Maiti

10:20 -10:40 am Coffee Break

* Keynote Speaker
<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:40 - 11:10 am</td>
<td>Advanced Kinetics of Thermally-induced Heterogeneous Processes by Local Linear Procedures</td>
<td>A. Rotaru (INFLPR / CEEC-TAC)</td>
</tr>
<tr>
<td>11:10 - 11:40 am</td>
<td>Different Approaches to the Kinetic Analysis of the Thermal Degradation of Polymeric Materials</td>
<td>M. Erceg (Faculty of Chemistry and Technology), I. Krešić, M. Jakić</td>
</tr>
<tr>
<td>11:40 - 12:00 pm</td>
<td>Influence of Reinforcer on Kinetic Behavior in the Thermal Degradation of Polyethylene Terephthalate</td>
<td>S. Yamada (National Defense Academy of Japan), K. Kiyohara, M. Tsuchiya, N. Koga</td>
</tr>
<tr>
<td>12:00 - 2:20 pm</td>
<td>Lunch Break and Plenary Lecture</td>
<td></td>
</tr>
<tr>
<td>2:20 - 2:50 pm</td>
<td>Kinetic Evaluation for Superimposed Exo- and Endothermal Events</td>
<td>N. Muravyev (Semenov Institute of Chemical Physics), A. Bragin, K. Monogarov, A. Pivkina</td>
</tr>
<tr>
<td>2:50 - 3:20 pm</td>
<td>Kinetic Analysis of Complex Processes – Our Sleeping Beauty</td>
<td>R. Svoboda (University of Pardubice)</td>
</tr>
<tr>
<td>3:20 - 3:40 pm</td>
<td>Coffee Break</td>
<td></td>
</tr>
<tr>
<td>3:40 - 4:00 pm</td>
<td>Kinetic Descriptions for Solidification, Solid-state Transformation and Grain Growth</td>
<td>F. Liu (Northwestern Polytechnical University)</td>
</tr>
<tr>
<td>4:00 - 4:20 pm</td>
<td>Determination of Kinetics and Thermodynamics of Thermal Decomposition for Polymer/Flame Retardant Blends</td>
<td>S. Stoliarov (University of Maryland), Y. Ding</td>
</tr>
<tr>
<td>4:20 - 4:40 pm</td>
<td>Kinetic Characterization of the Rate Retardation Phenomenon During Pressurized CO2-Gasification of Coal Chars Under Presence of CO</td>
<td>M. Sciazko (Institute for Chemical Processing of Coal)</td>
</tr>
<tr>
<td>4:40 - 5:00 pm</td>
<td>Reduction Kinetics of Iron Based Oxygen Carrier Produced From Pigments for Application for Coal Combustion</td>
<td>M. Sciazko (Institute for Chemical Processing of Coal), E. Ksepko</td>
</tr>
</tbody>
</table>

* Keynote Speaker
Thermoelectric Properties
Mockingbird 1

Yoshikazu Shinohara – NIMS (Session Chair)

9:00 - 9:20 am  Evaluation of Thermoelectric Properties of Organic Thermoelectric Thin Films
Y. Shinohara (NIMS), Y. Takagiwa, M. Shibuya, M. Goto, Y. Isoda, R. Maeda, I. Kanazawa

9:20 - 9:40 am  Synthesis and Measurement of Ubiquitous Bulk Thermoelectric Materials
Y. Takagiwa (National Institute for Materials Science), Y. Isoda, M. Goto, Y. Shinohara

9:40 - 10:00 am  High-throughput Sputter Material Synthesis for Thermal Management and Thermoelectric Conversion Research
M. Goto (National Institute for Materials Science), M. Sasaki, Y. B. Xu, Y. Takagiwa, Y. Isoda, Y. Shinohara

10:00 - 10:20 am  Thermoelectric Properties and Carrier Type Control of Alkaline-earth Hexaborides
M. Takeda (Nagaoka University of Technology)

Thermal Transport and Electrical Properties
Mockingbird 1

Robert Campbell – Netzsch Instruments (Session Chair)

10:40 - 11:00 am  Evaluation of Phase Change Thermal Interface Materials
K. Schoch (Northrop Grumman), P. Panackal, L. Nusbaum, C. Pullins, T. Vasilow

11:00 - 11:20 am  Origins of Ultralow Thermal Conductivity in Phenyl-C61-Butyric Acid Methyl Ester
J. H. Pöhls (Dalhousie University), M. B. Johnson, M. A. White

11:20 - 11:40 am  High Temperature Thermal Conductivity Measurements of Graphite Insulation Using Laser Flash Diffusivity
R. Campbell (Netzsch Instruments, N.A., LLC)

11:40 - 12:00 pm  Void Level in Composites by Thermal Diffusivity
S. Sauerbrunn (University of Delaware - CCM), J. Deitzel

* Keynote Speaker
### Food Technology and Related Areas

#### Mockingbird 1

**Perla Relkin – AgroParisTech (Session Chair)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Speaker Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:20 - 3:40</td>
<td>Coffee Break</td>
<td></td>
</tr>
<tr>
<td>3:40 - 4:00</td>
<td>Thermodynamics of Cooking Transition of Egg Omelet</td>
<td><em>D. Sharma</em>, WIT, K. Driscoll</td>
</tr>
<tr>
<td>4:00 - 4:20</td>
<td>Thermooxidative Decomposition of Indian Mustard Oil</td>
<td><em>R. K. Verma</em>, Patna University, A. Kumar, A. K. Singh, L. Verma</td>
</tr>
<tr>
<td>4:40 - 5:00</td>
<td>Investigation of Thermal Conductivity Variation of Biomass Products</td>
<td><em>B. Dikici</em>, Ery Riddle Aronautical University, P.R. Bommi Narasimha, S. Kamdar</td>
</tr>
</tbody>
</table>

### Fuels and Biofuels

#### Ospyrey 2

**Steve Sauerbrunn – University of Delaware (Session Chair)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Speaker Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00 - 9:20 am</td>
<td>Investigation Stage Devolatilization During Thermochemical Conversion of Low-grade Solid Fuels</td>
<td><em>A. Kozlov</em>, Melentiev Energy Sistems Institute Siberian Branch of the Russian Academy of Sciences, D. Svishech, A. Keiko, V. Shamansky</td>
</tr>
</tbody>
</table>

* Keynote Speaker
9:20 - 9:40 am | Thermal Characterization of Heavy Crude Oils Fractions  
*M. Mothe (Federal University of Rio de Janeiro), M. Perin, C. Mothe, C.F. Thomaka*

9:40 - 10:00 am | The Impact of Climate Change and Tree Origin to the Bioenergy Potential of Silver Birch  
*A. Haapala (University of Eastern Finland), S. Kontunen-Soppela, B. Mola Yudego, I. Miettinen, M. Mäkinen, J. Jänis*

10:00 - 10:20 am | Fast Profiling of Petrochemical Samples and Simulation of Processes by Thermal Analysis-Photoionization Mass Spectrometry  

10:20 - 10:40 am | Coffee Break

10:40 - 11:00 am | Specific Heat Capacity of Liquid Fuels Above the Boiling Point  
*S. Sauerbrunn (University of Delaware - CCM)*

11:00 - 11:20 am | Heat of Vaporization (HOV) of Gasoline/Ethanol Blends by TGA-DSC  
*S. Sauerbrunn (University of Delaware - CCM)*

11:20 - 11:40 am | Thermal Processing in Air of Ethylic Soybean biodiesel After Accelerated Aging With and Without Antioxidants  
*R. Leonardo (Chemical School / Federal University of Rio de Janeiro), J. Dweck, M. L. Murta Valle*

11: 40 - 12:00 pm | A Technique for the Determination of Pyrolytic Tar Characteristics  
*A. Kozlov (Melentiev Energy Sistems Institute Siberian Branch of the Russian Academy of Sciences), D. Svishech, V. Shamansky, A. Keiko*

---

**Natural Products**  
Osprey 2

**Paul Vaitiekunas – TA Instruments (Session Chair)**

2:20 - 2:40 pm | Thermoporosimetry and Rheology of Wood Fibers  
*M. Tasooji (Virginia Tech), C. Frazier*

2:40 - 3:00 pm | Deriving Transport Properties using Quasi-Heat-Pulse Solutions for Luikov’s Equations of Heat and Moisture Transfer with K-Tester Enhanced with Surface RH Sensors  
*M. Dietenberger (USDA Forest Products Laboratory), C. Boardman*

* Keynote Speaker
3:00 - 3:20 pm  Synergy of SO₂ Solgel Surface Modification and an Intumescent Coating on Fire Retardancy of Wood Based Materials
M. Dietenberger (USDA Forest Products Laboratory), M. Tshabalala

3:20 - 3:40 pm  Coffee Break

3:40 - 4:00 pm  Analysis of Eco-MCPS, a Web-database for Eco-Products, Materials, and Thermal Analysis Representing Japan
R. Ozao (SONY Institute of Higher Education), T. Utsumi, T. Ishii, Y. Shinohara, H. Kakisawa

4:00 - 4:20 pm  Hybrids Based on Biopolymer/Halloysite Clay Nanotubes for Cultural Heritage Applications
G. Cavallaro (University of Palermo), V. R. Bertolino, S. Milioto, G. Lazzara, F. Parisi

4:20 - 4:40 pm  Mechanisms of Adsorption and Influence of Water Binding on Soil Organic Matter
J. Kucerik (University of Koblenz-Landau), Y. Kunhi Mouvenchery, P. Ondruch, G. E. Schaumann

**Polymer Phase Transformation**
Swan 7 & 8

Christopher Li – Drexel University (Session Chair)

*  9:00 - 9:40 am  Secondary Crystallization and Aging in Ethylene-Based Carboxylic Acid Ionomers
B. Grady (University of Oklahoma)

9:40 - 10:00 am  Effect of Melt Annealing on Self-Nucleation of Random Ethylene 1-Alkene Copolymers
X. Chen (Florida State University), R. G. Alamo

10:00 - 10:20 am  Effect of Surface on Phase Transitions of n-Alkyl Alcohol Thin Film
M. Iwasa (Hitachi High-Tech Science Corporation), S. Kakinoki, K. Emoto, H. Yoshida

10:20 - 10:40 am  Coffee Break

10:40 - 11:00 am  Characterization and Properties of Dual Reactor Ziegler-Natta Impact Polypropylene Copolymers (IPC)
L. Santonja-Blasco (Florida State University), W. Runsgwang, R. G. Alamo

11:00 - 11:20 am  Crystallization Kinetics of Chlorinated Precision Polyethylene
X. Zhang (Florida State University), L. Santonja-Blasco, K. Wagener, E. Boz, R. G. Alamo

* Keynote Speaker
C. Li (Drexel University)  PPT-6

11:40 - 12:00 pm  Crystal-to-crystal Transitions in a High Temperature Polyamide
J. Menczel (Thermal Measurements)  PPT-7

12:00 - 2:20 pm  Lunch and Plenary Lecture

*  2:20 - 3:00 pm  Heat Capacity in Hysteresis in Semicrystalline Polymers
J. Menczel (Thermal Measurements)  PPT-8

3:00 - 3:20 pm  The Use of Calorimetry in Modelling Mechanical and Optical Properties of Semicrystalline Polymers
A. Menyhárd (Budapest University of Technology and Economics)  PPT-9

3:20 - 3:40 pm  Coffee Break

3:40 - 4:00 pm  Multi-functional Liquid Crystalline Epoxy Networks
M. Kessler (Washington State University), Y. Li  PPT-10

4:00 - 4:20 pm  Improving PVA Fiber Thermal Analysis Curve Interpretation Viewing the Transformations in Real Time
J. Dweck (Rio de Janeiro Federal University), A. Oliveira, I. Negulescu, R. Toledo Filho  PPT-11

* Keynote Speaker
**Wednesday, August 17, 2016**

**Plenary Lectures**

**SETARAM ICTAC Award**
Swan Ballroom

8:00 - 9:00 am  
Thermal Analysis in Biological and Medical Applications  
*D. Lőrinczy* (Dept. Biophysics School of Med. Univ. Pécs)  
**PL-5**

- **Kinetics**
  Osprey 1

**Sergey Vyazovkin – University of Alabama Birmingham**  
**Nobuyoshi Koga – Hiroshima University**  
**Jiri Malek – University of Pardubice**

9:00 - 9:20 am  
New Insights in Thermal Decomposition of Axobisisobutyronitrile  
*N. Muravyev* (Semenov Institute of Chemical Physics), *K. Monogarov, Y. Frolov, A. Pivkina*  
**KIN-24**

9:20 - 9:40 am  
SADT Calculation of AIBN Based on DSC and ARC Experiments  
*E. Moukhina* (NETZSCH Geraetebau GmbH)  
**KIN-25**

9:40 - 10:00 am  
Kinetic Analysis of the Fast Reactions on the Basis of the Oxy-combustion of Coal Chars  
*M. Sciazko* (Institute for Chemical Processing of Coal)  
**KIN-26**

10:00 - 10:20 am  
Impact of Oxygen Carrier Usage on the Reactivity of Coal Char in Chemical Looping Combustion with CuO oxygen carrier  
*P. Wang* (Department of Energy), *N. Means, B. Howard*  
**KIN-27**

10:20 - 10:40 am  
Coffee Break

10: 40 -11:00 am  
Logics and Practice of Kinetic Deconvolution Analysis of Complex Solid-state Reactions  
*N. Koga* (Hiroshima University)  
**KIN-28**

* 11:00 - 11:40 am  
ICTAC Kinetics Committee Recommendations: Present Status and Future Development  
*S. Vyazovkin* (University of Alabama-Birmingham)  
**KIN-29**

* Keynote Speaker
## Polymer Stability, Degradation, and Flammability

Osprey 2

**Jeremy Clifton – Northrop Grumman**

**Mark Beach – Dow Chemical (Session Chairs)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Presenter(s)</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>* 9:00 – 9:40 am</td>
<td>Thermal Degradation of Phosphorus Compounds Derived from Isosorbide bis-Acrylate</td>
<td>Y. Daniel (Central Michigan University), B. A. Howell</td>
<td>PSDF-1</td>
</tr>
<tr>
<td>9:40 – 10:00 am</td>
<td>Role of the Metal Complex on the Pyrolysis of Co(II)-[picolyl Terminated Telechelic Poly(dimethylsiloxane)s]</td>
<td>M. Tsuchiya (National Defense Academy), S. Yamada</td>
<td>PSDF-2</td>
</tr>
<tr>
<td>10:00 – 10:20 am</td>
<td>Thermal Degradation of Flame Retardant Compounds Derived From Castor Oil</td>
<td>E. Ostrander (Central Michigan University)</td>
<td>PSDF-3</td>
</tr>
<tr>
<td>10:20 - 10:40 am</td>
<td>Coffee Break</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:40 - 11:00 am</td>
<td>Studies of Flame Retardant Mechanisms Associated with Carbon-Michael Rigid Foams: A Non-Isocyanate Replacement for Polyurethane Foams</td>
<td>M. Beach (Dow Chemical), K. Patankar, S. Chen, B. Gerhart, X. Jin</td>
<td>PSDF-4</td>
</tr>
<tr>
<td>11:00 -11:20 am</td>
<td>Effects of UV for Cycloaliphatic Epoxy Resin Via Thermokinetic Models, Novel Calorimetric Technology, and Gaseous Product Analysis</td>
<td>B. Laiwang (National Yunlin University of Science and Technology), Y. T. Tsai, C. M. Shu</td>
<td>PSDF-5</td>
</tr>
<tr>
<td>11:20 - 11:40 am</td>
<td>Thermal Stability of Poly(vinylchloride) Formulations Containing Iron Additives as a Replacement for Antimony Oxide</td>
<td>Y. G. Daniel (Central Michigan University), B. A. Howell, F. J. Butwin</td>
<td>PSDF-6</td>
</tr>
<tr>
<td>11:40 – 12:00 pm</td>
<td>Rheology in Customizing Silicone Elastomer Cure Properties: A New Approach to the Inhibition and Control of Cure</td>
<td>G. Munzing (Gelest Inc), J. Matisons</td>
<td>PSDF-7</td>
</tr>
</tbody>
</table>

* Keynote Speaker

---

**11:40 - 12:00**

Kinetics Committee Discussion

---

---

---

---
Energetic Materials and Thermal Hazards
Swan 7 & 8

Brandon Weeks – Texas Tech University
Wim de Klerk - TNO
Astumi Miyake - Yokohama National University
Chi-Min Shu - National Yunlin University of Science and Technology
(Session Chairs)

* 9:00 - 9:40 am  Synthesis and Thermal Analysis of Pyrotechnic Energetic Polyurethane Foams
  J. Oxley (University of Rhode Island), R. Levine, J. Smith  EM-1

9:40 - 10:00 am  The Influence of Environmental Processing Conditions on the Reactivity of Aluminum with Various Oxidizing Agents
  R. Padhye (Texas Tech University)  EM-2

10:00 - 10:20 am  Reduction of Explosion Hazard of Silver Oxalate-Part I: Mg-scale Tests for Sensitivity Evaluation
  Y. Sato (National Institute of Occupational Safety and Health, Japan), K. Okada, M. Akiyoshi, T. Matsunaga, Y. Makita, H. Kubo  EM-3

10:20 - 10:40 am  Coffee Break

10:40 - 11:00 am  Extracting Hydrocarbons from Unconventional Sources
  J. Grebowicz (University of Houston-Downtown)  EM-4

11:00 - 11:20 am  Reduction of Explosion Hazard of Silver Oxalate-Part II: Gram-Scale Explosion Hazard Analysis

11:20 - 11:40 am  Thermal Decomposition of Explosives Monitored by Raman Spectroscopy
  J. Oxley (University of Rhode Island), L. McLennan, J. Smith  EM-6

11:40 - 12:00 pm  Compatibility Assessment of Liquids with High Explosives by Ampoule and Titration Heat Flow Calorimetry (HFC)
  J. Roberts (AWE), A. Macdonald  EM-7

Biomaterials, Biopolymers
Mockingbird

Patrick Smith – Michigan State University, Midland (Session Chair)

* 9:00 - 9:40 am  Thermal Properties of Phosphorus Derivatives of Isosorbide
  B.A. Howell (Central Michigan University), Y. Daniel  BM-1

* Keynote Speaker
9:40 - 10:00 am  
Thermal Analyses of Poly(lactic acid) PLA and Microground Paper Composites  
R. Bubeck (Michigan State University, Midland), P. Smith, A. Dumitrascu, A. Merrington  
BM-2

10:00 - 10:20 am  
Stereocomplex Crystallization of Poly (propylene succinate) from the Melt  
R.G. Alamo (Florida State University), O. Okpowe, G. Coates, J.M. Longo  
BM-3

10:20 - 10:40 am  
Coffee Break

10:40 - 11:00 am  
Synthesis and Thermal Stability of Hyperbranched Poly(ester)s  
P. Smith (Michigan State University, Midland), T. Zhang, B.A. Howell  
BM-4

11:00 - 11:20 am  
Thermal Analysis of Thermally Reversible Gels Made of a Bio-based, Biodegradable Polymer  
B. Sobieski (University of Delaware), B. Chase, I. Noda, J. Rabolt  
BM-5

11:20 - 11:40 am  
Thermal Degradation of Biobased Plasticizers Derived from 2,5-bis-(Hydroxymethyl)furan  
S. Lazar (Central Michigan University), B.A. Howell  
BM-6

11:40 - 12:00 pm  
Utilizing Thermal Analysis to Elucidate Biopolymer and Biomaterial Behavior Isosorbide as Monomer, Effects of Electrospinning, Collagen or Gelatin  
M. Jaffe (New Jersey Institute of Technology)  
BM-7

Lunch Break  
12:00 to 1:20 pm

Events and Gala  
1:20 to 9:30 pm

* Keynote Speaker
Thursday, August 18, 2016

Plenary Lectures

NATAS Award – sponsored by Mettler - Toledo
Swan Ballroom

8:00 - 9:00 am  Melting Kinetics of Polymer Crystals Examined by Fast-scan DSC
A. Toda (Hiroshima University), S. Yamashita, T. Ando, K. Taguchi, K. Nozaki, M. Maruyama, Y. Mizutani, K. Tagashira, T. Fukushima, H. Kaji, M. Konishi

Glasses, Thermosets, and Nanoconfinement
Osprey 1

Yung Koh – Texas Tech University

* 9:00 - 9:40 am  NATAS Student Award sponsored by SETARAM
Sizze-dependent Melting of Structurally Segmented Aliphatic Lamellar Crystals
Z. Ye (University of Illinois at Urbana-Champaign), L. de la Rama, M. Efremov, K. Seymour, W. Kriven, L. Allen

9:40 - 10:00 am  Confinement Studies in Anodic Aluminum Oxide (AAO) Nanopores Using Flash Differential Scanning Calorimetry
M. R. Pallaka (Texas Tech University), S. Simon

10:00 - 10:20 am  Relationship Between Fragility and Tg Changes on Confinement for Three Cyanurates
E. Lopez (Texas Tech University), S. Simon

10:20 - 10:40 am  Coffee Break

10:40 - 11:00 am  Structural Hindrances and Relaxation Dynamics at the Glass Transition in the Amorphous Fractions of Polylactide
N. Delpouve (AMME-LECAP Normandie Univ, Université de Rouen), L. Delbreilh, J. Grenet, A. Saiter, E. Dargent

11:00 - 11:20 am  Enthalpy Recovery of Physical Aging for Amorphous Poly(lactic acid) by Advanced Thermal Analysis
M. Pyda (Rzeszow University of Technology), A. Drogon, A. Czerniecka

* Keynote Speaker
11:20 - 11:40 am  
Glass Transition and Structural Recovery for Single Polystyrene Films  
Y. P. Koh (Texas Tech University), S. Simon  

11:40 - 12:00 pm  
Exploring Specific Heat Variation of Tg, Tc and Tm Transitions of a Silver Doped Chalcogenide Glass  
D. Sharma (WIT), J. MacDonald, R. Shukla, A. Kumar  

12:00 - 1:20 pm  
Lunch Break  

1:20 - 1:40 pm  
Equilibrium Free-Radical Polymerization of Acrylate Monomer under Nanoconfinement  
H. Zhao (Texas Tech University), S. Simon  

1:40 - 2:00 pm  
Characterization of Self-healing Polymer Materials  
G. Van Assche (Vrije Universiteit Brussel), J. Brancart, M. M. Diaz Acevedo, A. Torre Muruzabal, A. Cuvellier, H. Rahier  

**Lifetime Prediction**  
Mockingbird  

Ignazio Blanco – University of Catania (Session Chair)  

* 9:00 - 9:40 am  
Lifetime Prediction of Materials Studied by Isoconversional Methods  
P. Šimon (Slovak University of Technology), T. Dubaj, Z. Cibulková  

9:40 - 10:00 am  
Lifetime Prediction of Nitrile Rubber By a Sensitive In-situ Stability Evaluation Method  
R. Yang (Tsinghua University), X. Liu, J. Zhao  

10:00 - 10:20 am  
Ageing and Lifetime Prediction of Polymer Nanocomposites With Layered Silicates  
K. Pielichowski (Cracow University of Technology), T. Majka  

10:20 - 10:40 am  
Coffee Break  

10:40 - 11:00 am  
Thermochemical Ageing of Polymers: New Challenges in Experimental Testing and Modelling  
A. Herzig (University of the Bundeswehr Munich, Institute of Mechanics), B. Musil, M. Johlitz, A. Lion  

11:00 - 11:20 am  
Towards a Predictive, Multi-scale Aging Model for Complex Silicone Architectures  
R. Maxwell (Lawrence Livermore National Laboratory), E. Glascoe, J. Lewicki  

* Keynote Speaker
<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:20 - 11:40 am</td>
<td>Effect of Nanofillers and Extrusion on the Thermoxidative Stability of Polypropylene Studied by DTA</td>
<td>Z. Cibulková (Slovak University of Technology), A. Chochulová, P. Šimon</td>
</tr>
<tr>
<td>11:40 - 12:00 pm</td>
<td>Multi-step Equilibrium Recovery in Glassy Polymers in Bulk and Under Nanoscale Confinement</td>
<td>D. Cangialosi (CSIC), V. M. Boucher, A. Alegria, J. Colmenero</td>
</tr>
<tr>
<td>12:00 - 1:20 pm</td>
<td>Lunch Break</td>
<td></td>
</tr>
<tr>
<td>1:20 - 1:40 pm</td>
<td>Procedure for Obtaining Individual Kinetic Parameters From Complex Reactions</td>
<td>C. A. Ribeiro (Instituto de Química/UNESP), J. M. V. Capela, M. V. Capela</td>
</tr>
<tr>
<td>1:40 - 2:00 pm</td>
<td>Stability Prediction from Forced Degradation Studies by Using Advanced Kinetics and Statistical Analysis</td>
<td>D. Clenet (Sanofi-Pasteur), F. Imbert, P. Probeck, N. Rahman, F. Ausar</td>
</tr>
<tr>
<td>2:00 - 2:20 pm</td>
<td>Model-free Isoconversional Predictions of Conversion Rates During Pyrolysis of Lignocellulosic Biomass</td>
<td>L. Norberg Samuelsson (KTH Royal Institute of Technology), M. Bäbler</td>
</tr>
<tr>
<td>2:40 - 3:00 pm</td>
<td>Oxidative Stability Prediction of Conjugated Linoleic Acid Stabilized Via Complexation With Dietary Fibre</td>
<td>T. Dubaj (Slovak University of Technology), P. Šimon</td>
</tr>
<tr>
<td>3:00 - 3:20 pm</td>
<td>Thermal Analysis, Powder Characterization and Kinetic Modeling to Explain Loss of Activity of CaO During Carbonation</td>
<td>L. Favergeon (Ecole des Mines), L. Rouchon, M. Pijolat</td>
</tr>
<tr>
<td>3:20 - 3:40 pm</td>
<td>Coffee Break</td>
<td></td>
</tr>
<tr>
<td>3:40 - 4:00 pm</td>
<td>Kinetic Study of Thermal Degradation Mechanism and Lifetime Prediction of Cashew Polysaccharide</td>
<td>C. Mothe (Federal University of Rio de Janeiro), J. Freitas</td>
</tr>
</tbody>
</table>

* Keynote Speaker
Energetic Materials and Thermal Hazards
Swan 7 & 8

Brandon Weeks – Texas Tech University
Wim de Klerk - TNO
Astumi Miyake - Yokohama National University
Chi-Min Shu - National Yunlin University of Science and Technology
(Session Chairs)

* 9:00 - 9:40 am  Evaluation of Hazard Indicators Based on Merging Results of DSC and Cook-off Test
                  B. Roduit (AKTS AG), M. Hartmann, P. Folly, A. Sarbach

9:40 - 10:00 am  HP-DSC Combined with Microscopy Applied to Explosives and Propellants
                  C. t Hoen (TNO), E. Krabbendam – La Haye

10:00 - 10:20 am  Thermal Hazard Analysis and Chemical Incompatibility Test with Novel Custom High-Pressure Crucibles Made from Commonly Used Metals and Alloys
                  H. Xia (University of Notre Dame), J. Brennecke

10:20 - 10:40 am  Coffee Break

10:40 - 11:00 am  Thermal Hazards Investigation of a Pharmaceutical Intermediate
                  R. Zhao (Merck)

11:00 - 11:20 am  Non-isothermal Sublimation Kinetics of 2,4,6-trinitrotoluene (TNT) Nanofilms
                  W. Hikal (Australian college of Kuwait), B. Weeks

11:20 - 11:40 am  Numerical Simulation for the Thermal-mechanical Response for PBX-2 Explosives at Different Heating Rates
                  X. Zhang (Institute of Applied Physics and Computational Mathematics), T. Hong, H. Dong

11:40 - 12:00 pm  Thermal Decomposition Behavior and Mechanical Sensitivity of Ammonium Nitrate/Potassium Nitrate/Polymer-mixed Particles Prepared by Spray Drying
                  K. Katoh (Fukuoka University), S. Nagayama, E. Higashi, M. Noda, H. Habu

12:00 - 1:20 pm  Lunch Break

* Keynote Speaker
<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:20 - 2:00 pm</td>
<td>Using Thermal Methods to Understand the Interactions between a Rocket Propellant and Igniter Material</td>
<td>R. Tunnell (QinetiQ)</td>
</tr>
<tr>
<td>2:00 - 2:20 pm</td>
<td>Kinetics Analysis of Thermal Decomposition of Ammonium Dinitramide (ADN) Based Ionic Liquid Propellant</td>
<td>Y. Izato (Yokohama National University), M. Hayata, H. Habu, A. Miyake</td>
</tr>
<tr>
<td>2:40 - 3:00 pm</td>
<td>Initial Thermal Decomposition Mechanisms of Triazolone Derivatives Using Thermal Analysis and Molecular Orbital Calculation</td>
<td>S. Yoshino (Niho University), K. Sakamoto, T. Komoriya</td>
</tr>
<tr>
<td>3:00 - 3:20 pm</td>
<td>Investigation for Pellet to Clad Interaction in Nuclear Reactors</td>
<td>Y. Peng (China Institute of Atomic Energy)</td>
</tr>
<tr>
<td>3:20 - 3:40 pm</td>
<td>Coffee Break</td>
<td></td>
</tr>
<tr>
<td>3:40 - 4:00 pm</td>
<td>Use of Heat Flow Calorimetry for the Stability Evaluation of “Green” Propellants</td>
<td>R. Dobson (Eurenco (PB Clermont)), A. Dejeaifve, N. Fonder, L. Monseur</td>
</tr>
<tr>
<td>4:00 - 4:20 pm</td>
<td>Cubane Decomposition Pathways – A Comprehensive Study</td>
<td>N. Kumbhakarna (Indian Institute of Technology Bombay), B.S. Bimal, A. Chowdhury</td>
</tr>
<tr>
<td>4:20 - 4:40 pm</td>
<td>Characterization of RDX, a Propellant and a Pyrotechnic Mixture:</td>
<td>Round Robin Between Nine European Test Houses</td>
</tr>
<tr>
<td></td>
<td></td>
<td>E. Krabbendam – La Haye (TNO), W. de Klerk, E. van Arkel</td>
</tr>
</tbody>
</table>

**Biomaterials, Biopolymers**

**Mockingbird**

Patrick Smith – Michigan State University, Midland (Session Chair)

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00 - 9:40 am</td>
<td>Comparative Study of Flexible Water-insoluble Mori, Thai, Eri, Muga and Tussah Silk Films</td>
<td>Hu, X. (Rowan University)</td>
</tr>
<tr>
<td>9:40 - 10:00 am</td>
<td>Silk-Keratin Thin Film Biomaterials</td>
<td>W. Huang (Tufts University), D. Kaplan</td>
</tr>
</tbody>
</table>

* Keynote Speaker
10:00 - 10:20 am  Stimuli Responsive Silk-Elastin-Like Protein Biomaterials for Drug Delivery
*W. Huang (Tufts University), D. Kaplan*  BM-10

10:20 - 10:40 am  Coffee Break

10:40 - 11:00 am  Folding Thermodynamics of Jellyfish Collagens Under Acidic and Neutral pH Conditions
*M. Oda (Kyoto Prefectural University), A. Miki, S. Inaba, T. Takayuki, K. Kihira, H. Fukada*  BM-11

11:00 - 11:20 am  Thermodynamic studies on protein conformational fluctuations
*S. Inaba (Kyoto Prefectural University), M. Oda*  BM-12

11:20 - 11:40 am  Derivatives of Amphiphilic Cationic Chitosan: Thermal Characterization
*C. Cavalheiro (Instituto de Química de São Carlos - USP), J. Gabriel, A. Poli, V. Tiera*  BM-13

**Standards, Regulations and Reference Materials**

**Osprey 2**

Roger Blaine - Retired
Haruka Abe – National Metrology Institute of Japan (Session Chairs)

*R. Blaine (retired)*  STND-1

1:40 - 2:00 pm  Standards and Reference Materials for Thermal Measurements
*R. Tye (Consultant)*  STND-2

2:00 - 2:20 pm  Methods, and Standards for Thermal Micromethods: Experimental Comparison and Need for Regulations
*S. Giani (Mettler-Toledo AG), S. Sauerbrunn*  STND-3

*R. Blaine (retired)*  STND-4

2:40 - 3:00 pm  Terminology in Thermal Analysis and Calorimetry: Recent Progress and Question Marks
*J. Rouquerol (Aix Marseille University - CNRS)*  STND-5

3:00 - 3:20 pm  Meta-Analysis Determination of Kinetic Parameters for Decomposition Reference Materials by Thermogravimetry
*R. Blaine (retired)*  STND-6

* Keynote Speaker
3:20 - 3:40 pm  Coffee Break

3:40 - 4:00 pm  Round-Robin Test for Specific Heat Capacity Measurement of Solid Materials by Differential Scanning Calorimeter


4:00 - 4:20 pm  In Search of Thermal Effusivity Reference Materials

R. Blaine (retired)

4:20 - 4:40 pm  Candidate Standard Reference Material for Thermal Effusivity

S. Ackermann (Thermal Analysis Labs), R. Bateman, A. Harris, K. Lilova
## Friday, August 19, 2016

### Plenary Lecture

**NATAS Fellow Award – sponsored by Netzsch Instruments**  
Swan Ballroom

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
</table>
| 8:00 - 9:00 am | How Thermal Analysis Helped Define and Solve Major Industrial Collaborative Programs As Well As the Use of TMDSC in Distinguishing Between the Hydrophobic and Hydrophilic Forces  
*J. Matisons (Gelest Inc)* | Swan Ballroom |

### Fast Scanning Methods

**Swan 9**

Dimitri Iranov - Institut de Sciences des Matériaux de Mulhouse (Session Chair)

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
</table>
| * 9:00 - 9:40 am | Quantitative Analysis of Semicrystalline Polymers Using Fast Scanning Calorimetry  
P. Cebe (Tufts University), B. Partlow, D. Kaplan, A. Wurm, E. Zhuravlev, C. Schick | FSM-1       |
| 9:40 - 10:00 am | The Flash DSC - A Novel Method for the Characterization of the Crystallization of Polybutadiene  
C. Wrana (Mettler Toledo), J. Schawe | FSM-2       |
| 10:00 - 10:20 am | Investigating Adulteration of Extra Virgin Olive Oil with Hazelnut and Soybean Oils Using Fast DSC  
I. van Wetten (Xensor Integration), S. van Herwaarden, R. Splinter, R. Boerrigter-Eenling, S. van Ruth | FSM-3       |
| 10:20 - 10:40 am | Coffee Break                                                                                   |             |
| 10:40 - 11:00 am | Evaluation of Multiple Plateaus or Relaxations using the TNM Model of Structural Recovery  
R. Bari (Texas Tech University), S. Simon | FSM-4       |
| 11:00 - 11:20 am | Existence of Three Activation Energy in Glassy Se₉₀In₈Ag₂ Alloys  
D. Sharma (WIT), J. MacDonald, R. Shukla, A. Kumar | FSM-5       |
| 11:20 - 11:40 am | Fragility of Ionic Liquids Measured by Flash Differential Scanning Calorimetry  
R. Tao (National Institute of Standards and Technology), E. Gurung, M.M. Cetin, M. Mayer, E. Quitevis, S. Simon | FSM-6       |

* Keynote Speaker
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:40 - 12:00 pm</td>
<td>Heat Capacity, Nucleation, and Crystallization in Poly(vinyl alcohol) Thin Films by Fast Scanning Calorimetry</td>
<td>D. Thomas (Tufts University), A. Wurm, E. Zhuravlev, C. Schick, P. Cebe</td>
</tr>
<tr>
<td>12:00 - 12:20 pm</td>
<td>Combining Nanocalorimetry and In-situ Nano- or Micro-focus X-ray Scattering to Address Fast Structure Formation Processes</td>
<td>D. Ivanov (Institut de Sciences des Matériaux de Mulhouse - IS2M), M. Rosenthal, A. Melnikov, A. Rychkov, A. Rodygin, D. Doblas, M. Burghammer</td>
</tr>
</tbody>
</table>

**Rheology and Viscoelasticity**

Swan 10

Leela Rakesh - CMU  
Jan Vermant - ETH Zürich (Session Chairs)

* 9:00 - 9:40 am  
Fluids Are All Around Us, Is Rheology Around Us?  
L. Rakesh (CMU)

9:40 - 10:00 am  
Fingerprinting the Non-linear Response of a Polystyrene Solution: Comparison of Strain Controlled and Stress Controlled Mechanical Spectral Hole Burning  
Z. Qian (Texas Tech University), G. McKenna

10:00 - 10:20 am  
Effect of Humidity in Rheology and DMA  
R. Führer (Anton Paar), K. Pondicherry, J. Läuger, A. Gunther

10:20 - 10:40 am  
Coffee Break

10:40 - 11:00 am  
Rheological Properties of Aqueous Cellulose with Curcumin  
L. Rakesh (CMU), N. Ventimiglia, Y. Zhang

11:00 - 11:20 am  
Viscoelastic Properties of Konjac Glucomannan in the Presence of Salts  
N. Almeida (Central Michigan University), L. Rakesh, A. Mueller, S. Hirschi, Y. Zhang

11:20 - 11:40 am  
Rheology of Corn Starch and Nanocellulose  
L. Rakesh (CMU), Y. Zhang

* Keynote Speaker
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:40 - 12:00 pm</td>
<td>Evaluation of Dynamic Mechanical Test Methods</td>
</tr>
<tr>
<td></td>
<td>M. Gibson (3M), E. Breedlove, A. Hedegaard, E. Rexeisen</td>
</tr>
<tr>
<td>12:00 - 12:20 pm</td>
<td>Film Impact Performance and Adhesion Study in Multilayered Systems</td>
</tr>
<tr>
<td></td>
<td>S. Reynaud (Arkema), E. Crocker</td>
</tr>
<tr>
<td></td>
<td>L. Rakesh (CMU), J. Odumegwu</td>
</tr>
</tbody>
</table>

**Energetic Materials and Thermal Hazards**

Swan 8

Brandon Weeks – Texas Tech University
Wim de Klerk - TNO
Astumi Miyake - Yokohama National University
Chi-Min Shu - National Yunlin University of Science and Technology
(Session Chairs)

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00 - 9:20 am</td>
<td>Role of Thermal Analysis in Screening and Analyzing Cocrystallization of Energetic Materials</td>
</tr>
<tr>
<td></td>
<td>J. Oxley (University of Rhode Island), D. Swanson, T. Taylor, J. Smith</td>
</tr>
<tr>
<td>9:20 - 9:40 am</td>
<td>A Numerical &amp; Experimental Study of the Decomposition Pathways of Guanidinium Nitrates</td>
</tr>
<tr>
<td></td>
<td>N. Kumbhakarna (Indian Institute of Technology Bombay), A. Chowdhury, L. Mallick, S. Kumar, A. Sankaranarayanan</td>
</tr>
<tr>
<td>9:40 - 10:00 am</td>
<td>Thermal Properties of Energetic Ionic Liquid Propellant Based on Ammonium Dinitramide with Cellulose Derivatives</td>
</tr>
<tr>
<td></td>
<td>K. Shiota (Yokohama National University), Y.I. Izato, H. Matsunaga, H. Habu, A. Miyake</td>
</tr>
<tr>
<td>10:00 – 10:20 am</td>
<td>An Updated Method for the Determination of Compatibility of High Explosives by DSC and TGA</td>
</tr>
<tr>
<td></td>
<td>B. Yancey (Lawrence Livermore National Laboratory), E. Glascoe, A. Gash</td>
</tr>
</tbody>
</table>

* Keynote Speaker
Process Safety
Swan 8

Wassila Benaissa - Solvay
Chi-Min Shu - National Yunlin University of Science and Technology
(Session Chairs)

* 10:40 - 11:20 am  Comparison of 18650 Lithium Ion Batteries in Series or Parallel for Thermal Explosion Hazards by Vent Sizing Package 2
  C. M. Shu (National Yunlin University of Science and Technology), C. Y. Huang, Y. W. Wang, W. C. Chen  PS-1

11:20 - 11:40 am  Thermal Runaway Analysis of Lithium-ion Battery with Overcharge
  Y. L. Zhu (Beijing Institute of Technology), C. Qi, Q. J. Jiao  PS-2

11:40 - 12:00 pm  Using Low Thermal Inertia Adiabatic Calorimetry Data with AKTS-Thermokinetics Software: A Case Study
  K. Kurko (Fauske & Associates, LLC)  PS-3

12:00 - 12:20 pm  Control of Process Safety Based on Thermal Dynamics of Reactor and Reaction Kinetics
  C. Guinand (University of Applied Sciences of Western Switzerland), M. Dabros, B. Roduit, T. Meyer, F. Stoessel  PS-4

12:20 - 12:40 pm  Zinc Dialkyldithiophosphate Decomposition Model Development
  J. Miller (Lubrizol), T. Adams  PS-5

12:40 - 1:00 pm  Thermal Runaway Analysis of Lithium-ion Battery with Overcharge
  Y. L. Zhu (Beijing Institute of Technology), C. Qi, Q. J. Jiao  PS-6

Inorganic Materials, Geochemistry, and Ceramics
Macaw

Ranjit K. Verma – Patna University (Session Chair)

* 9:00 - 9:40 am  Multifunctional Ferrite Nano Particles: Use of Thermal Analysis in Optimization of the Annealing Temperature of Citrate Precursors

* 9:40 - 10:20 am  Thermal Analysis in Materials Science
  I. M. Szilagyi (Budapest University of Technology and Economics)  INORG-2

* Keynote Speaker  63
<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Presenters</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:20 - 10:40 am</td>
<td>Coffee Break</td>
<td></td>
<td>INORG-3</td>
</tr>
<tr>
<td>10:40 - 11:00 am</td>
<td>Application of TA Methods in the Field of Ceramic Pigments</td>
<td>N. Gorodylova (University of Pardubice), P. Šulcová</td>
<td>INORG-3</td>
</tr>
<tr>
<td>11:00 - 11:20 am</td>
<td>Thermal Behavior of Sodium Hydroxide-structural Concrete Composition</td>
<td>S. Kikuchi (Japan Atomic Energy Agency), N. Koga, H. Seino</td>
<td>INORG-4</td>
</tr>
<tr>
<td>11:20 - 11:40 am</td>
<td>Analyzing Dioctyl-bis(2-ethylhexylmaleate)tin</td>
<td>J. Matisons (Gelest Inc), G. Munzing</td>
<td>INORG-5</td>
</tr>
<tr>
<td>11:40 - 12:00 pm</td>
<td>Thermal Conductivity and Thermal Expansion Characterization of Novel Geopolymer Materials</td>
<td>S. Ackermann (Thermal Analysis Labs), W. Rickard, A. Van Riessen, L. Vickers</td>
<td>INORG-6</td>
</tr>
</tbody>
</table>

**Lunch Break**

**Closing Ceremonies**

1:00 – 3:00 pm
Author Index

Abe, H., P-51, P-64, STND-7
Ackermann, S., STND-9, INORG-6
Adams, T., P-19, PC-4, PS-5
Agari, Y., STND-7
Akama, T., STND-7
Aki, H., P-46, P-54, P-55, P-56
Akiyoshi, M., EM-3, EM-5
Akoshima, M., P-51, STND-7
Alamo, R.G., SP-9, PPT-2, PPT-4, PPT-5, BM-3
Alegria, A., LP-7
Allen, L., GL-1
Almeida, A., P-57
Almeida, N., RH-10
Almeida, S., P-52
Alonso, J., P-57
Ambrosini, A., HT-2
Ambrozini, B., PHARM-3
Amimoto, K., P-34
Amimoto, T., P-34
Ando, T., PL-6
Andre, R., IM-7
Arakawa, Y., STND-7
Araujo, C., P-59
Arikawa, Y., P-56
Arroyo, J., P-10
Ausar, F., LP-9
Babiniec, S., HT-2
Babler, M., LP-10
Baeten, D., FSM-9
Barbosa, H., P-48
Bari, R., FSM-4
Basit, A., PHARM-2
Bastidas-Barranco, M., P-42
Batean, R., STND-9
Battistelle, R., P-43, P-44, P-50
Beach, M., PSDF-3
Bertolino, V.R., NP-5
Bezerra, B., P-43, P-44, P-50
Bikiaris, D., P-1, P-2, P-4, P-5, P-38
Bill, D., P-60
Bimal, B.S., EM-21
Blaine, R., STND-1, STND-4, STND-6, STND-8
Blanco, I., P-41
Boardman, C., NP-2
Boerrigter-Eenling, R., FSM-3
Bokarev, S., SP-3
Bommi Narasimha, P.R., FT-6
Bottino, F.A., P-41
Boucher, V.M., LP-7
Boz, E., SP-9, PPT-5
Bragin, A., KIN-18
Brancart, J., GL-9
Braz, C., P-52
Breedlove, E., RH-7
Brennecke, J., EM-10
Bubeck, R., BM-2
Bueno, M., P-50
Bulanek, R., Burghammer, M., FSM-8
Burnham, A., KIN-1
Butwin, F.J., PSDF-6
Buzin, A., KIN-10
Calhoun, N., PC-3
Campbell, R., TT-3
Candioto, K.C.G., P-31
Cangialosi, D., LP-7
Cao, C.R., P-25
Capela, J.M.V., P-37, LP-8, LP-11
Capela, M.V., P-37, LP-8
Carreño, G., P-10
Cardoso, G., P-18
Carn, F., FT-2
Castro, R., P-30, HT-1
Cavallaro, G., PHARM-3
Cavallaro, G., NP-5
Cebé, P., P-15, SP-11, FSM-1, FSM-7
Cetin, M.M., FSM-6
Cervini, P., PHARM-3
Chandra Maiti, S., KIN-14
Chantre, J., SP-1
Charsley, E., PL-1
Chase, B., BM-5
Chen, H.W., P-23
Chen, J., SP-7, KIN-7
Chen, J.R., P-13, P-25
Chen, S., PSDF-3
Chen, W.C., P-14, P-22, PS-1
Chen, W.T., P-22, P-23
Chen, X., PPT-2
Chrissafis, K., P-6, P-38
Chochulova, A., LP-6
Chowdhury, A., IM-3, EM-21, EM-24
Chung, Y.H., P-14, P-25, HT-4
Chvalun, S., KIN-10
CibilKOVA, Z., LP-1, LP-6
Clenet, D., LP-9
Coates, G., BM-3
Coker, E., HT-2
Colmenero, J., LP-7
Conturbia, G., P-33
Cormack, G., PS-2
Crespi, M., P-52, P-53, LP-11
Criado, J.M., KIN-12
Crocker, E., RH-8
Cuvellier, A., GL-9
Czerniecka, A., GL-5
da Graça, D., P-18
de la Rama, L., GL-1
de Klerk W., EM-22
Dabros, M., PS-4
Daniel, Y., PSDF-5, BM-1
Daniel, Y.G., PSDF-6
Dargent, E., GL-4
De Marchi, M.R., LP-11
Deal, A., HT-5
Deguchi, T., STND-7
Deitzel, J., MP-4, TT-4
Dejeaifve, A., EM-20
Delbreilh, L., GL-4
Delpouve, N., GL-4
Denner, T., SP-3, IM-6, FT-5, FB-4
Dias, D., LP-11
Diaz Acevedo, M.M., GL-9
Dietenberger, M., NP-2, NP-3
Dikici, B., FT-6
Ding, Y., KIN-21
Dinhane, F., P-50
Djabourov, M., FT-2
Dmitryakov, P., KIN-10
Dobson, R., EM-20
Dobias, D., FSM-8
Dodoo, C., PHARM-2
Dong, H., EM-13
Drazin, J., HT-3
Driscoll, K., FT-3
Drogon, A., GL-5
Dubaj, T., KIN-4, LP-1, LP-12
Dumitrascu, A., BM-3
Durazzo, M., P-33, MP-5
Dweck, J., FB-7, PPT-11
Efimova, A., IM-6
Efremov, M., GL-1
Ehler, S., FT-5
Emoto, K., PPT-3
Erceg, M., KIN-16
Faria, L., P-40
Favergeon, L., KIN-3, KIN-13, LP-13
Ferreira, A., P-29, P-30, P-48, P-58, PHARM-3
Fischer, M., SP-3, IM-6, FT-5, FB-4
Folly, P., KIN-5, EM-8
Fonder, N., EM-20
Fonseca Corre, R.A., SP-12
Fontanari, G., P-53
Frazier, C., NP-1
Freitas, J., LP-14
Frolov, Y., KIN-24
Fuhrer, R., RH-3
Fukada, H., BM-11
Fukui, S., SP-2
Fukushima, M., PHARM-1
Fukushima, T., PL-6
Fujimura, J., SP-10
Fujisawa, M., P-54, P-55, P-56, P-65
Fujisawa, T., P-26
Gabriel, J., P-27, BM-13
Gaisford, S., PHARM-2
Gallo, R., P-30
Gao, J., HT-5
Gerhart, B., PSDF-3
Ghoroi, C., KIN-14
Gian, S., STND-3
Gibson, M., RH-7
Giesbrecht, N., P-62
Giraldo, L., P-42, SP-12
Glascoe, E., LP-5
Goderis, B., FSM-9
Gomes da Cruz, C., P-21
Miller, J., HT-2, PS-5
Mika Fujino, D., P-44
Miki, A., BM-11
Mishima, Y., P-16
Miyake, A., P-11, P-20, SP-4, EM-16, EM-17, EM-25
Miyake, Y., STND-7
Mizutani, Y., PL-6
Mohle, T., SP-3
Mola Yudego, B., FB-3
Monogarov, K., KIN-18, KIN-24
Monseur, L., EM-20
Morales, C., P-10
Moreira, A., P-33, MP-5
Moreno-Pirajan, J.C., P-42, SP-12
Mothe, C., P-18, P-21, P-59, P-62, SP-1, FB-2, LP-14
Mothe, M., P-21, P-59, SP-1, FB-2
Moukhina, E., IM-5, KIN-25
Mueller, A., RH-10
Munzing, G., RH-5, INORG-5
Muravyev, N., KIN-18, KIN-24
Murrelli Machado, L.C., PHARM-3
Murasawa, C., STND-7
Murta Valle, M.L., FB-7
Musil, B., LP-4
Nagatsu, Y., STND-7
Nagayama, S., EM-14
Naito, M., P-51
Naito, R., STND-7
Nakashima, M., SP-8
Nascimento, L.A., P-21
Negulescu, I., PPT-11
Nishimoto, Y., P-45, P-63, P-64
Nishimura, S., P-61
Nishiyama, E., SP-10
Nishiyama, Y., P-17, IM-2
Niu, H., P-32
Noda, I., BM-5
Noda, M., EM-14, EM-17
Noecker, B., PC-5
Norberg Samuelsson, L., LP-10
Nozaki, K., PL-6
Nozela, W., P-52
Numajiri, H., STND-7
Nusbaum, L., TT-1
Oda, K., STND-7
Oda, M., BM-11, BM-12
Odumegwu, J., RH-9
Ohata, T., P-46, P-54, P-55, P-56
Okada, A., STND-7
Okada, K., EM-3, EM-5
Okhrimenko, L., KIN-13
Okpowe, O., BM-3
Oliveira, A., PPT-11
Oliveira, J., P-57
Oliveira, M.A.M., P-62
Ondruch, P., NP-6
Ostrander, E., PSDF-2
Oxley, J., EM-1, EM-6, EM-23
Ozao, R., P-47, P-64, NP-4
Padhye, R., EM-2
Pallaka, M.R., GL-2
Panackal, P., TT-1
Paolucci, F., MP-2
Papadopoulou, E., P-6
Partlow, B., FSM-1
Parisi, F., NP-5
Parodi, E., MP-1
Patankar, K., PSDF-3
Pathak, P.K., INORG-1
Patsiaoura, D., P-38
Pavanello, F., IM-8
Pavlidou, E., P-38
Peccinini, R., P-57
Peng, Y., EM-19
Perejon, A., KIN-12
Perez-Maqueda, L.A., KIN-12
Perin, M., FB-2
Perpetuo, G., P-43
Peters, G., MP-1, MP-2
Pielichowski, K., LP-3
Pijolat, M., KIN-3, KIN-13, LP-13
Pijpers, T., FSM-9
Pinto, B., P-29
Pivkina, A., KIN-18, KIN-24
Pohls, J.H., TT-2
Pokorny, M., P-3
Poli, A., P-27, P-28, BM-13
Pondicherry, K., RH-3
Popescu, C., PC-2, PC-5
Portale, G., FSM-9
Povea, P., P-10
Prado, J., SP-7, KIN-7
Probeck, P., LP-9
Pullins, C., TT-1
Pyda, M., GL-5
Qi, C., PS-6
Qian, Z., RH-2
Quitevis E., FSM-6
Rabolt, J., BM-5
Rahier, H., GL-9
Rahman, N., LP-9
Rakesh, L., RH-1, RH-4, RH-6, RH-9, RH-10
Ravalli, M., HT-5
Rebicek, J., P-3
Relkin, P., FT-1
Reller, A., SP-3, IM-6
Reis, J., P-57
Reis, M., P-57
Restivo, T., P-33, MP-5
Rexeisen, E., RH-7
Reynaud, S., RH-8
Ribeiro, C.A., P-37, P-53, P-57, LP-8, LP-11
Rickard, W., INORG-6
Riella, H., P-33
Riikonen, J., IM-4
Roberts, J., EM-7
Roberts, M., PS-1
Roduit, B., KIN-5, EM-8, PS-4
Rodygin, A., FSM-8
Rosenthal, M., FSM-8
Rotaru, A., PL-2, KIN-15
Rouchon, L., LP-13
Rouquerol, J., STND-5
Rungswang, W., PPT-4
Rychkov, A., FSM-8
Saienga, J., IM-8
Sailer, A., GL-4
Sakamoto, K., EM-18
Sanchez Jimenez, P.E., KIN-12
Sankaranarayanan, A., EM-24
Santonja-Blasco, L., PPT-4, PPT-5
Santos, J., P-57
Santos, M., P-39, P-40
Saraji-Bozorgzad, M.R., SP-3, IM-6, FT-5, FB-4
Sarbach, A., KIN-5, EM-8
Sasaki, M., TEP-3, STND-7
Sasaki, N., STND-7
Sato, Y., EM-3, EM-5
Sauerbrunn, S., MP-4, TT-4, FB-5, FB-6, STND-3
Sawada, Y., P-64
Schaumann, G.E., NP-6
Schawe, J., FSM-2
Schick, C., P-15, FSM-1, FSM-7
Schmidt, P., IM-6
Schoch, K., TT-1
Sciazzko, M., KIN-22, KIN-23, KIN-26
Seino, H., INORG-4
Seymour, K., GL-1
Shamansky, V., FB-1, FB-8
Sharma, D., P-36, KIN-11, PC-3, FT-3, GL-7, FSM-5
Sharma, S., KIN-11
Shen, S.J., P-13, P-22, P-23, P-25
Shibata, K., P-17, IM-2
Shibuya, M., TEP-1
Shigue, C., P-31
Shimizu, Y., P-64
Shinohara, Y., P-47, TEP-1, TEP-2, TEP-3, NP-4
Shiota, K., SP-4, EM-25
Shu, C.M., P-14, P-23, P-24, HT-4, PSDF-4, PS-1
Shu, Q., P-32
Shukla, R., P-36, KIN-11, GL-7, FSM-5
Siewert, C., P-49
Simon, P., KIN-4, LP-1, LP-6, LP-12
Simon, S., SP-13, GL-2, GL-3, GL-6, GL-8, FSM-4, FSM-6
Singh, A.K., FT-4, INORG-1
Singh, R.K., INORG-1
Smejkalova, D., P-3, PC-1
Smith, J., PL-4, EM-1, EM-6, EM-23
Smith, P., BM-2, BM-4
Sobral, P.J.A., FT-2
Sojbeski, B., BM-5
Souza, M., P-58
Speitel, L., IM-1
Splinter, R., FSM-3
Yamashita, S., PL-6
Yamazaki, A., P-64
Yang, R., LP-2
Ye, Z., GL-1
Yo Abe, R., EM-5
Yokota, M., SP-10
Yoshida, H., P-64, PPT-3
Yoshikawa, M., P-26
Yoshino, S., EM-18
Yoshino, T., STND-7
Yoshioka, T., STND-7
You, M.L., P-22
Yukawa, M., P-46, P-54, P-55, P-56
Zadorosny, L., P-39, P-40
Zhang, T., BM-4
Zhang, X., SP-9, PPT-5, EM-13
Zhang, Y., RH-4, RH-6, RH-10
Zhao, H., GL-8
Zhao, J., LP-2
Zhao, R., EM-11
Zhu, Y.L., PS-6
Zhuravlev, E., P-15, FSM-1, FSM-7
Zidek, O., P-3
Zimmermann, R., SP-3, IM-6, FT-5, FB-4