
SUNDAY, MAY 12

Technical Program

3:30 PM REGISTRATION BOOTH OPENS

LECTURE SESSION I – DISCUSSION LEADER: JAIME GRUNLAN

4:30 PM OPENING REMARKS

4:45 PM 1. **Alexander Morgan, University of Dayton Research Institute**
Flammability Measurement of Roofing Materials: Heat Release and Burn-Through Experiments with the “Cube Test”, ASTM E3367

5:10 PM 2. **Morgan Bruns, St. Mary’s University and Isaac Leventon, National Institute of Standards and Technology**
Automated Characterization of Thermal Conductivity of Flammable Materials

5:35 PM BREAK

5:50 PM 3. **Richard E. Lyon, Federal Aviation Administration**
Fire Growth Potential of Combustible Solids Measured in the Cone Calorimeter

6:15 PM 4. **Fernando Raffan-Montoya, University of Maryland**
Advances in Milligram-scale Flame Calorimetry

6:40 PM 5. **Mauro Zammarano, National Institute of Standards and Technology**
Delaying Fire Growth and Preventing Flashover with Flame-Retardant-Free Upholstered Furniture

7:05 PM WELCOME RECEPTION | END DAILY SESSION

MONDAY, MAY 13

7:30 AM CONTINENTAL BREAKFAST

LECTURE SESSION II – DISCUSSION LEADER: ALEXANDER MORGAN

8:30 AM 6. **Timothy Reilly and Stephen Scherrer, pinfa North America**
Status of FR-containing Materials for Fire Safety: North American Regulations, Public Perception & Outlook

8:55 AM 7. **Grace Wan, Dow Chemical Company**
Emerging Fire Resistance Materials Need and Challenges with Various Applications from Industrial Viewpoints

9:20 AM 8. **Mark McKinnon, Fire Safety Research Institute**
Development and Use of the FSRI Materials and Products Database

9:45 AM BREAK

10:05 AM 9. **Serge Bourbigot, University of Lille**
Fire Behavior of Polymeric Materials in O₂ Rich Environment and Under Hydrogen Flame

10:30 AM 10. **Bernhard Scharfel, Bundesanstalt für Materialforschung und -prüfung (BAM)**
More than the Sum of its Parts – Synergistic FR-Combinations

10:55 AM 11. **Gaëlle Fontaine, Centrale Lille Institute**
Thermoset Resin to Flame Retard Poly(lactic acid)

11:20 AM 12. **Jaime C. Grunlan, Texas A&M University**
Heat Shielding and Flame Retardancy from Polyelectrolyte-Based Nanocomposite Coatings

11:45 AM LUNCH ON YOUR OWN

MONDAY, MAY 13, CONT'D

LECTURE SESSION III – DISCUSSION LEADER: SERGE BOURBIGOT AND GAËLLE FONTAINE

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|---------|-----|---|
| 2:00 PM | 13. | Stanislav I. Stoliarov, University of Maryland
Targeting Fire-Growth-Controlling Material Properties as a Strategy for Design of the Next Generation of Flame Retardant Materials |
| 2:25 PM | 14. | Richard N. Walters, Federal Aviation Administration
Using Machine Learning to Determine Fire Test Parameters |
| 2:50 PM | 15. | Abdenour Amokrane, EDF R&D
Influence of Input Parameters Variation Intervals on the Results of Sensitivity Analysis of a Pyrolysis Model |
| 3:15 PM | 16. | Anthony Chun Yin Yuen, Hong Kong Polytechnic University and Ivan Miguel De Cachinho Cordeiro, University of New South Wales
Molecular Characterisation on Flame Retardant Mechanism of Phosphorous-Based Polymer Composites |
| 3:40 PM | | BREAK |
| 4:00 PM | 17. | Hatsuo Ishida, Case Western Reserve University
Synthesis of a Bio-Based, Recyclable, Intrinsically Flame-retardant Benzoxazine Resin Satisfying Twelve Principles of Green Chemistry: Quantitative Evaluation |
| 4:25 PM | 18. | Maude Jimenez, University of Lille
Self-Stratifying Flame Retardant Coatings for Plastics - towards Eco-Efficient Smart Coatings |
| 4:50 PM | 19. | Svetlana Tretsiakova-McNally, Ulster University
Enhancing Fire Retardance of Styrenic Polymers Through a Ter-Polymerization Route |
| 5:15 PM | 20. | Paul Joseph, Victoria University
Chemical Modification of Some Acrylic Polymers with Phosphorus-Containing Groups: Effects on Their Flame Retardance |
| 5:40 PM | | POSTER SESSION AND RECEPTION |
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TUESDAY, MAY 14

7:30 AM CONTINENTAL BREAKFAST

LECTURE SESSION IV – DISCUSSION LEADER: MAUDE JIMENEZ AND CLAIRE NEGRELL

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| 8:30 AM | 21. | Sabyasachi Gaan, Empa Swiss Federal Laboratories for Materials Science and Technology
Reprocessable Fire Safe Phosphonated Resins |
| 8:55 AM | 22. | Todd Emrick, University of Massachusetts
Functional Heterocyclic Polymers as Flame-retardant Materials |
| 9:20 AM | 23. | Qingsheng Wang, Texas A&M University
Development of Flame Retardant Technology for Plastics using Metal-Organic Frameworks |
| 9:45 AM | | BREAK |
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TUESDAY, MAY 14, CONT'D

10:05 AM 24. **Gordon L. Nelson, Florida Institute of Technology**
New Flexible Non-Halogen FR Polyurethane Foam

10:30 AM 25. **Baljinder Kandola, University of Bolton**
Sensing Early Detection of Fires in Carbon Fibre Composites: Detection of Volatile Evolution during Degradation of Resin

10:55 AM 26. **Sabine Fuchs, Hamm-Lippstadt University of Applied Sciences**
N,P-Silane- and Phosphonate-(Co-)Polymer-Functionalized Silica Nanoparticles as Flame Retardants for Transparent Thermoplastics

11:20 AM 27. **Fabienne Samyn, University of Lille**
Development of Solutions to Flame Retard PLA/Flax Fibers Composites made from Comingled Non-Woven

11:45 AM LUNCH ON YOUR OWN

LECTURE SESSION V – DISCUSSION LEADER: SABYASACHI GAAN AND SABINE FUCHS

2:00 PM 28. **Yuan Hu, University of Science and Technology of China**
Several Typical Phosphorus-Containing Flame Retardants: Synthesis, Performances and Applications

2:25 PM 29. **Claire Negrell, University of Montpellier**
Synthesis of Phosphorus Biobased Flame Retardant Additives for the Development of New Binders for Wood Paint with Low Environmental Impact

2:50 PM 30. **Vinay Medhekar, Cornerstone Chemical Company**
Melamine-Based Fire-Resistant Polymers

3:15 PM 31. **Maria Jauregui Roza, Bundesanstalt für Materialforschung und – prüfung (BAM)**
Weaving through Fire and Force: Fire Behavior, Fire Stability and Modes of Action between Epoxy Resin and Glass-Fiber Composites

3:40 PM BREAK

4:00 PM 32. **Valeria Berner, Fraunhofer Institute for Chemical Technology ICT**
Thermal and Flame-Retardant Epoxy Vitrimers based on Disulfide Bonds

4:25 PM 33. **Ramaswamy Nagarajan, University of Massachusetts Lowell**
Regenerative FR Treatment of Cotton and Mechanistic Understanding of FR Characteristics after Washing

4:50 PM 34. **Helge-Otto Fabritius, Hamm-Lippstadt University of Applied Sciences**
Bio-Inspired Flame Retardant Systems for Wood-Plastic Composites based on Bio-Based Polybutylene Succinate and Standard Polyolefins

5:15 PM 35. **Andrew Maizel, National Institute of Standards and Technology**
Per- and Polyfluoroalkyl Substances in New Firefighter Turnout Gear Textiles

5:40 PM END DAILY SESSIONS | DINNER ON YOUR OWN

WEDNESDAY, MAY 15

7:30 AM CONTINENTAL BREAKFAST

LECTURE SESSION II – DISCUSSION LEADER: MAURO ZAMMARANO AND BALJINDER KANDOLA

Erik J. Price, Sherwin-Williams

8:30 AM 36. Linking Chemistry to Market via Problem Statements: Connection of Industry & Solution Space

Changxin Lyla Dong, Stanford University

8:55 AM 37. Water-Enhancing Fire Gel with Aerogel Activated In Situ

9:20 AM BREAK

9:35 AM 38. **SPEAKER CANCELLATION**

Xin Wang, University of Science and Technology of China

10:00 AM 39. Bio-Based, Anti-Flammable and Recyclable Epoxy Thermosets and Fiber-reinforced Composites

Mohi Quadir, North Dakota State University

10:25 AM 40. Development and Evaluation of Fire-Protective Resins Rich in Biobased Contents for Metal Substrate Coatings

10:50 AM CLOSING REMARKS: ALEXANDER MORGAN

MONDAY, MAY 13, 2023

POSTER PROGRAM

1. **M. Andruschko**, P. Frank, and U. Jonas, S. Fuchs
Hochschule Hamm-Lippstadt
Synthesis, characterization, processing and flame-retardant properties of halogen-free styrenic copolymers

2. **Yusuf Ziya Menciloglu**, Gizem Semra Ariturk, and Tugba Ucar Demir
Sabanci University
Synergistic Advancements of Halloysite Nanotube and Commercial Flame Retardant in Low-Density Polyethylene Composite for Enhanced Fire Resistance in Commercial Applications

3. Mohammad Bagheri, Kashani, **Sourabh Kulkarni**, Md AlAmin, Saurabh Karande, Walter Zukas, Ravi Mosurkal, James Whitten, Ramaswamy Nagarajan, and Amir Ameli
University of Massachusetts Lowell
Fire Retardant Thermoplastic Urethane Membranes Electrospun on Nyco for Chem-Bio Protection

4. **I.B.Y Chen**, Q Chen, and A.C.Y. Yuen
City University of Hong Kong, Kowloon Tong
Experimental and Molecular Dynamics Investigation on Thermal Oxidation of Graphdiyne Type Materials

5. Ivan Miguel De Cachinho Cordeiro, **Richard Kwok Kit Yuen**, and Guan Heng Yeoh
University of New South Wales, Sydney, NSW 2052, Australia
Multiscale Pyrolysis Modelling of Polymers Foams

6. **Changxin Lyla Dong**
Stanford University
Water-enhancing fire gel with aerogel activated in situ

7. **Ander Labaien Etxeberria**, Jochen A.H. Dreyer, and Søren Kill
DTU Chemical
Quantification of pore size and shape distributions in intumescent coatings chars: Effects of heating rate

8. **POSTER CANCELLATION**

9. **Sarah G. Fisher**, Danixa Rodriguez-Melendez, Ethan T. Iverson, Thomas J. Kolibaba, and Jaime C. Grunlan
Texas A&M University
Fire Protection of Wood with an Environmentally Benign UV-Cured Polyelectrolyte Complex

10. **Sarzina Hossain**, Farhan Ansari, and Kimy Yeung
Dow Chemical
Novel Testing Capability for Flame Spread Rate Assessment

11. **C.-C. Höhne**, C. Vogt, J. Limburger, A. König, and T. Wagener, E. Kroke
Fraunhofer Institute for Chemical Technology ICT
s-Triazine phosphonates as replacement of the flame retardant tris(2-chloro-1-methylethyl)phosphate (TCPP) in polyurethane rigid foams

12. **Amy C. Kurr** and David P. Harper
University of Tennessee – Knoxville
Multivariate Approach to Predict Thermal Degradation in Wire and Cable Insulation

POSTER PROGRAM

13. **Isaac T. Leventon**, Morgan C. Bruns, and Michael V. Heck
National Institute of Standards and Technology
The NIST Material Flammability Database
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14. **Maya D. Montemayor**, Natalie A. Vest, Bethany Palen, Dallin L. Smith, and Jaime C. Grunlan
Texas A&M University
Boron-Containing Polyelectrolyte Complex for Self-Extinguishing Polyurethane Foam
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15. **Beril Oguz**, Emil Lidman Olsson, Jochen A.H. Dreyer, and Kim Dam-Johansen
Technical University of Denmark
Developing a Lab-Scale Testing Method for Intumescent Coatings
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16. **Milton H. Repollet Pedrosa**, Craig Gorin, Ryan Thomas, Hongyun Xu, James (Andy) Kenney, and Bizhong (Rocky) Zhu
Dow Chemical Company
Advanced Silicone Materials solutions for Effective Fire Protection and Safer EV Batteries
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17. **Thomas W. Roche**, Fernando Raffan-Montoya, Stanislav I. Stoliarov, Alexander B. Morgan, Sourabh Kulkarni, and Ramaswamy Nagarajan
University of Maryland
Use of Milligram-Scale Flame Calorimetry for Characterization Flammability of Fabrick Samples with Flame Retardant Treatments
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18. **Danixa Rodriguez-Melendez**, Dallin L. Smith, Sarah G. Fisher, Rodolphe Sonnier, Henri Vahabi, and Jaime C. Grunlan
Texas A&M University
Two-Step Polyelectrolyte Complex Coating for Flame Retardant Flax
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19. **Ruqing Shen**, Yufeng Quan, and Qingsheng Wang
Marshall University
Metal-based Flame Retardants to Improve the Fire Safety of Polypropylene
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20. Dallin L. Smith, Sidney M. Cotton, Natalie A. Vest, **Maya D. Montemayor**, and Jaime C. Grunlan
Texas A&M University
Phosphate and Nitrogen-Rich Polyelectrolyte Complex Flame Retardant Treatment for Cotton Fleece
-
21. **Rajgopal Subramanian**, Emma E. Murphy, Hector J. Lazaro, Joshua M. Ordonez, Michelle M. Shields, and David J. Irvin
Quantum Copper
Scale-up and Commercialization of a High Molecular Weight Flame Retardant Additive
-
22. **Andre Thompson**, Andrew Maizel, and Rick Davis
National Institute of Standards and Technology
Per- and Polyfluoroalkyl Substances in Firefighter Turnout Gear Textiles Exposed to Abrasion, Elevated Temperature, Laundering, or Weathering
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23. Anne-Cécile Kervella and **Claudio Toncelli**
Kermel
The Kermel Px: A Modular Concept in the Development of Intrinsically Fire-Resistant Fibers
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24. **Juan Carlos Gauna** and Morgan Bruns
St. Mary's University
Material-Specific Verification of Fire Model Properties
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25. **Yanfei Xu**
University of Massachusetts Amherst
Molecular Engineering for Enhanced Flame Retardancy and Reduced Thermal Conductivity in Polymers