



*Department of Chemistry and Technology of Polymers
Faculty of Chemical Engineering and Technology
Cracow University of Technology*

9th INTERNATIONAL SEMINAR ON MODERN POLYMERIC MATERIALS FOR ENVIRONMENTAL APPLICATIONS

including

Special Session

“Plastics in the Circular Economy”

Kraków, 20–22 May, 2026

PROGRAM



9th INTERNATIONAL SEMINAR ON MODERN POLYMERIC MATERIALS
FOR ENVIRONMENTAL APPLICATIONS

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20 May (Wednesday)

13.00-15.00 **Registration**

15.00-15.10 Opening of the Seminar:

Magdalena Niemczewska-Wójcik, Vice-Rector for Science of
the Cracow University of Technology

Piotr Michorczyk, Dean of the Faculty of Chemical Engineering
and Technology

Session Chairs: Ignazio Blanco, Janusz Datta

15.10-15.40 Georgios Chr. Psarras (INVITED)

*“Electrical performance of polymers and polymer-based
micro/nano-composites”*

15.40-16.00 Theodora Krasia-Christoforou

*“Functionalized electrospun fibers in environmental
applications”*

16.00-16.20 Mónika Nanys, Ákos György Juhász, Angéla Jedlovszky-Hajdú

*“Electrospinning nanofibrous scaffolds for potential wound
healing application: the effect of salts and humidity”*

16.20-16.40 Paulina Parcheta-Szwindowska, Julia Habaj, Tola Protasiewicz,
Janusz Datta

*“Polyurethane elastomers with high natural carbon content –
synthesis, characteristics, and life cycle analysis”*

16.40-17.00 Paweł Baran, Karol Awdykowicz, Katarzyna Matras-Postolek

*“Polymer-Embedded Lead Halide Perovskite Quantum Dots: A
Scalable Strategy for Enhanced Stability”*

17.00-19.00 **Welcome Reception**

21 May (Thursday)

Session Chairs: Theodora Krasia-Christoforou, Aleksander Prociak

- 09.00-09.30 Michele Modesti, Diego Penzo (INVITED)
“Chemical recycling of viscoelastic polyurethane foams via an acidolysis-based process”
- 09.30-09.50 Augustine Okechukwu Chukwuemeka, Gbenga Oluyemi, Auwalu I. Mohammed, Suhail Attar, James Njuguna
“Alternative Material Selection for Abandonment of High-Pressure High-Temperature (HPHT) Wells in Oil and Gas Applications”
- 09.50-10.10 Anna Sienkiewicz, Piotr Czub
“Hierarchical Polymer Composites with Diverse Synthetic and Natural Fillers for Advanced Engineering Applications”
- 10.10-10.30 Sarolta Halmoczki, Kitti Osan, Judit Domokos, Dóra Szabó, Edina Bugyik, Angela Jedlovszky-Hajdu
“Development of a ZnO Nanoparticle-Loaded Electrospun Polysuccinimide Scaffold for Biomedical Applications”
- 10.30-10.50 Andrzej Rybak
“Impact of accelerated aging on selected properties of polymer based on sustainable raw material for use in electrification devices”
- 10.50-11.20 **Coffee Break**

Session Chairs: Maciej Guzik, Georgios Chr. Psarras

- 11.20-11.50 Guillem Seychal, Nora Aranburu, Haritz Sardon, Jean-Marie Raquez (INVITED)
“Achieving sustainable and industrially relevant polymer dynamic networks for advanced materials through simple synergistic strategies: towards a circular economy of composite materials?”
- 11.50-12.10 Claudio Tosto, Lorena Saitta, Mattia Evangelista, Alberta Latteri, Pietro Russo, Gianluca Cicala, Ignazio Blanco
“From Powder Bed Fusion Waste to Filament for Fused Filament Fabrication: A Circular Approach for PA12 Recycling”

- 12.10-12.30 Rafail O. Ioannidis, Dimitrios N. Bikiaris
“The impact of block length and composition on the properties of PLA blocky copolyesters based on long aliphatic linear macroinitiator”
- 12.30-12.50 Elżbieta Malewska, Maria Kurańska, Michał Kucala, Sławomir Michałowski, Aleksander Prociak
“Bio-based Components for the Synthesis of Flexible Polyurethane Foams”
- 12.50-13.10 Justyna Proszek, Marta Gajewska, Krystian Sokołowski, Mateusz Marzec, Andrzej Bernasik, Paweł Dąbczyński, Jakub Rysz, Michael Bredol, Gabriela Kęsek, Katarzyna Matras-Postołek
“Synthesis and Electrochemical Characterization of ZnTe Nanoparticles”
- 13.10-14.10 **Lunch**

Special Session **“Plastics in the Circular Economy”**

Session Chairs: James Njuguna, Andrzej Rybak

- 14.10-14.40 Maria Kurańska, Elżbieta Malewska, Sławomir Michałowski, Aleksander Prociak (INVITED)
“Shaping the Future of Polyurethane Thermal Insulation Materials in a Circular Economy”
- 14.40-15.00 Maciej Guzik, Robert Karcz, Mariusz Gackowski, Joanna Kryściak-Czerwenka, Marijana Ponjavić, Darlington Nnabodo, Emmanuel Olusola Oke, Taghi Miri, Matthew Keith, Sanja Škaro Bogojević, Brana Pantelić, Jelena Simić, Tatjana Ilić-Tomić, Dušan Milivojević, Jasmina Nikodinović-Runić, Marcin Rychwalski, Romanos Siaperas, Evangelos Topakas, Filomena Freitas, Patrícia Concórdio-Reis
“Sustainable Scale-Up of PHA Production: Green Recovery Using Alkali, Deep Eutectic Solvents and Enzymatic Digestion”
- 15.00-15.20 Julia Habaj, Paulina Parcheta-Szwindowska, Janusz Datta
“Sustainable Pathways to Bio-based Poly(ester-ether) Polyols: Synthesis and Characterization”

- 15.20-15.40 Kamila Rułka, Anna Masek
“Polyphenol-Enriched Chitosan for Active Food Packaging”
- 15.40-16.00 Ewa Szczepanik, Kinga Pielichowska
“Sustainable Controlled-Release Fertilisers Modified with Waste Sheep Wool for Water Retention Improvement”
- 16.00-16.30 **Coffee Break**
- 16.30-18.00 **Poster session**
- 20.00-23.00 **Gala Dinner**

22 May (Friday)

Session Chairs: Michele Modesti, Kinga Pielichowska

- 09.00-09.30 Vivien Rizmajer, Panna Bittmann, Margit Benis, Sarolta Halmóczy, Eszter Tatár, Veronika, Pálos, Viktor Szilágyi, Mónika Nanys, Angéla Jedlovszky-Hajdú (INVITED)
“Composite Meshes for Biomedical Applications”
- 09.30-09.50 Kacper Mielczarek, Szczepan Bednarz, Artur Kołaciak-Hulbój, Hynek Beneš, Gloria Huerta-Angeles
“Itaconic vitrimers”
- 09.50-10.10 Rana Al Nakib, Gizem Arıttürk, Yeşim Aslan, Yusuf Ziya Menceloğlu
“Processing-controlled impact toughening and degradation response of PLA-PU-DMA blends: morphology–property relationships under kinetic mixing and extrusion”
- 10.10-10.30 Joanna Smorawska-Kliza, Janusz Datta, Ewa Głowińska
“Ferulic Acid as a Natural Additive for Improving the Thermo-Oxidative Stability of Thermoplastic Bio-Polyurethanes”
- 10.30-10.50 Paraskevas Kyriacou, Viktoria Theodorou, Michal Matysík, Iveta Plšková, Ivo Kusák, Theodora Krasia-Christoforou
“Sound insulation by means of Bio-Based Multilayer Hybrid Composites Based on Electrospun Fibers and Luffa Cylindrica”
- 10.50-11.20 **Coffee Break**

Session Chairs: Szczepan Bednarz, Konstantinos N. Raftopoulos

- 11.20-11.50 Izabela Czekaj (INVITED)
“Smart Modeling of Lignocellulosic Biomass: Vibrational Signatures as a Key to Environmental Polymer Innovation”
- 11.50-12.10 Albert J. Power, Alireza F. Behbahani, Vagelis Harmandaris, Anastassia N. Rissanou
“Atomistic Simulations of Polymer/Silica Nanocomposites: Conformations and Dynamics”
- 12.10-12.30 Veronika Tóth-Pálos, Dorottya Gréta Kis, Eszter Tatár, Margit Benis, Krisztina S. Nagy, Judit Domokos, Dóra Szabó, Ákos Zsembery, Angéla Jedlovszky-Hajdú
„Development of Polysuccinimide–Salt Nanofibers for Advanced Wound Dressing Applications”
- 12.30-12.50 Katarzyna Kisiel, Izabela Zaborniak, Agnieszka Sysło, Joanna Ortyl, Paweł Chmielarz
“Controlled surface functionalization of Carbon Quantum Dots through atom transfer radical polymerization”
- 12.50-13.10 Viktor Gergő Szilágyi, Nóra Neufeld, Ákos György Juhász, Angéla Jedlovszky-Hajdú,
“Simulation-Driven Insights into Electrospinning: Electric Field Modeling and Calcium Chloride-Induced Fiber Morphology”
- 13.10-14.10 **Lunch**

Session Chairs: Jan Krmela, Anastassia N. Rissanou

- 14.10-14.40 Suman Thakur, Manal Chaib, Emil Lopez-Hernandez, Mohammed Lahcini, Raquel Verdejo (INVITED)
“Non-Isocyanate Polyurethanes and Vitrimers: Sustainable Pathways to Advanced Polymer Networks”
- 14.40-15.00 Konstantinos N. Raftopoulos, Izabela Łukaszewska, Krzysztof Pielichowski
“Water in Non-Isocyanate Polyurethanes”
- 15.00-15.20 Dawid Lisowski, Anna Masek, *Natural Dye Based Chromatic Modification of Bacterial*
- 15.20-15.40 Michał Kucała, Elżbieta Malewska, Maria Kurańska, Aleksander Prociak
“Viscoelastic polyurethane foams obtained from renewable raw materials – laboratory scale vs. continuous process”

15.40-16.00 Ewa Mierzwa, Kacper Mielczarek, Szczepan Bednarz, Gloria Huerta-Ángeles, Hynek Beneš
“Synthesis of High Molecular Weight Poly(Itaconic Acid Esters)”

16.00-16.10 **Closing of the Seminar**

16.30-18.30 **Kraków Sightseeing**

Posters

1. Asmaa Alkassafary, Paulina Parcheta-Szwindowska, Janusz Datta, *Approaches to Flame Retardation of Bio-Based Polyurethane Elastomers with Hybrid Polyols*
2. Łukasz Bonder, Maria Kurańska, Sławomir Michałowski, Elżbieta Malewska, *Possibilities for Implementing Circular Economy Principles in the Manufacturing of Polyisocyanurate (PIR) Boards*
3. Artur Bukowczan, Katarzyna Skotnicka, Paulina Zając, Tomasz M. Majka, Krzysztof Pielichowski, *Nanofibrous Polylactide Scaffolds Incorporating Ibuprofen for Drug Delivery and Tissue Engineering*
4. Julia Habaj, Paulina Parcheta-Szwindowska, Janusz Datta, *Sustainability Assessment of Bio-Based Cast Polyurethanes Using Life Cycle Analysis*
5. Sara Simon, Shona Marsh, Krzysztof Hodor, *AI-Assisted Automated Quantification for Polymer Recycling Streams*
6. Edyta Hebda, Jan Ozimek, Maja Knapik, Wiktoria Gdańska, Krzysztof Pielichowski, *Design of hard segments in thermoplastic non-isocyanate polyurethanes using erythritol and aromatic bio-monomers*
7. Anna Jażdżewska, Joanna Smorawska-Kliza, Ewa Głowińska, *Influence of vanillin on the selected properties of bio-based thermoplastic polyurethane elastomers*
8. Alicja Szymka – Szymanik, Gabriela Kęsek, Katarzyna Matras-Postolek, *Graphitic Carbon Nitride-Based Materials for Photocatalysis*
9. Katarzyna Kirchof, Anna Marzec, Tzanko Tzanov, *Bio-Inspired Functional Cotton Textiles with Antibacterial Activity*
10. Natalia Kowalik, Klara Grelowska, Aleksandra Put, Hubert Ożóg, Julia Sędzimir, Michał Kucala, Elżbieta Malewska, Maria Kurańska, Aleksander Prociak, *From Solid Fats to Polyurethane Foams: Modified Oils as Functional Bio-Based Components*
11. Jan Krmela, Vladimíra Krmelová, Terézia Matejíková, Rastislav Hruškovič, Marek Makúch, Martina Fusková, *Effects of carbon fibers on selected properties of PETG filaments for FDM 3D printing*
12. Andrea Feriancová, Vladimíra Krmelová, Jan Krmela, Terézia Matejíková, Marek Makúch, Martina Fusková, *Selected recycled materials for 3D printing*

13. Patrycja Kula, Izabela Barszczewska-Rybarek, Alicja Kazek-Kęsik, Hubert Knap, Izabella Ślęzak-Prochazka, Grzegorz Chladek, *Innovative phthalate-free soft lining materials with antifungal activity – physicochemical and biological characterization*
14. Radosław Piech, Tomasz M. Majka, Krzysztof Pielichowski, *Novel lignin and chitosan modification path towards flame retardant for PHAs*
15. Anna Marzec, Bolesław Szadkowski, Katarzyna Kirchof, *Smart Polymer Bio-Packaging Systems Incorporating Natural pH-Sensing Compounds*
16. Oliwia Matysiak, Elżbieta Malewska, Maria Kurańska, *Viscoelastic foams modified with biocomponents*
17. Despoina Meimaroglou, Dimitrios N. Bikiaris, *Advancing Sustainable Materials Through PLA-PMA Copolymer Innovation*
18. Natalia Mierzwa, Sławomir Michałowski, Maria Kurańska, Kamila Sałasińska, Elżbieta Malewska, *Polyurethane-polyisocyanurate biofoams modified with flame retardants*
19. Karina Mihilewicz, Dominika Kmiecik, Patrycja Wójcik, Aline Dos Santos-Silva, Paulina Zając, Krzysztof Pielichowski, Katarzyna Bialik-Wąs, and Konstantinos N. Raftopoulos, *Water-polymer interactions at low hydrations in hydrogels based on poloxamers and natural ingredients*
20. Beata Mossety-Leszczak, Aleksandra Ziolo, *Synthesis and characterization of polycaprolactone using multifunctional macroinitiators*
21. Katarzyna Nowicka-Dunał, Karolina Rzepecka, Kinga Pielichowska, *Renewable Carbon Aerogels Infiltrated with MXene-Modified PCMs for Photothermal Energy Conversion*
22. Jan Ozimek, Edyta Hebda, Kinga Szoldrowska, Izabela Hyla, Kacper Paciorek, Patryk Baran, Magalena Kaszuba, Krzysztof Pielichowski, *Electrospinning of non-isocyanate polyurethane elastomers (NIPU) synthesized with various carbonate segments*
23. Hubert Ożóg, Aleksandra Put, Natalia Kowalik, Julia Sędzimir, Michał Kucała, Elżbieta Malewska, Maria Kurańska, *The influence of the isocyanate index of rigid polyurethane foams on the properties of rebiopolyols obtained as a result of their glycolysis*
24. Nikolaos Pardalis, Dimitrios N. Bikiaris, *Non-Isocyanate Polyurethanes via Sustainable Glycidylation and CO₂ Conversion of Bio-Derived Dicarboxylic Acids*
25. Diego Penzo, Michele Modesti, *Development of innovative chemical processes for the recycling of combined synthetic textiles*

26. Marek Piątkowski, Natalia Waclawik, Anita Wójcik, *Scaling up the microwave-assisted synthesis of chitosan hydrogels*
27. Radosław Piech, Tomasz M. Majka, Krzysztof Pielichowski, *Novel lignin and chitosan modification path towards flame retardant for PHAs*
28. Martyna Szatkowska, Martyna Bieda, Kinga Pielichowska, *Phase change materials shape stabilized with carbon aerogels modified with graphene for thermal energy conversion and storage*
29. Monika Pokladko-Kowar, Andrzej Danel, *Organic materials in optoelectronic applications*
30. Mirosława Prochoń, Szymon Szczepanik, Łukasz Stefaniak, *Sustainable Scleroprotein-Based Hybrid Filler for Enhancing Thermal and Fire Resistance of NBR Elastomers*
31. Tola Protasiewicz, Paulina Parcheta-Szwindowska, *Synthesis of waterborne polyurethane dispersion using in situ water generation for sustainable coating applications*
32. A. C. Patsidis, I. Savva, M. Karouzou, D. I. Batsouli, V. Drakonakis, G. C. Psarras, *PAN-PANi/GNP Nanocomposites: Morphological Characteristics, Thermal Response and Electrical properties*
33. Aleksandra Put, Hubert Ożóg, Julia Sędzimir, Natalia Kowalik, Michał Kucała, Elżbieta Malewska, Maria Kurańska, *Polyurethane biofoams modified with fruit seed oil biopolyols*
34. Eleftheria Xanthopoulou, Kyriazis C. Rekos, Konstantinos S. Triantafyllidis, Dimitrios N. Bikiaris, *Toward sustainability: Exploring the effect of biochar addition on the properties of poly(butylene succinate)*
35. Karina Rusin-Żurek, Stanisław Kuciel, *Novel composites reinforced with different types of fibers (basalt, quartz, aramid and polyimide) on a biobased polyethylene terephthalate matrix*
36. Julia Sędzimir, Hubert Ożóg, Aleksandra Put, Michał Kucała, Elżbieta Malewska, Maria Kurańska, *Chemical recycling of open-cell polyurethane biofoams synthesized using fruit seed oils*
37. Krzysztof Stafin, Paweł Śliwa, Marek Piątkowski, *From Ionic Assemblies to Apatite: Computational and Experimental Insights into Biomimetic Calcium Phosphate Formation in a Chitosan-Based Polyelectrolyte Complex Matrix*
38. Ewelina Stanik, Sławomir Michałowski, Maria Kurańska, Elżbieta Malewska, *Polyurethane-polyisocyanurate foams modified with biopolyols from vegetable oils*

39. Bolesław Szadkowski, Anna Marzec, *Multifunctional Bio-Based Hybrid Pigments for pH-Sensitive Biodegradable Packaging Composites*
40. Bartosz Trębacz, Karina Rusin-Żurek, *Wood–Plastic Composites Based on Polyvinyl Chloride: Structure and Mechanical Performance*
41. Aleksander Wątroba, Radosław Piech, Artur Bukowczan, Tomasz M. Majka, *Modification of asphalt with polymers as a method of increasing the durability of road surfaces - mini review*
42. Sara Wordingham, Guillem Seychal, Paulina Zając, Haritz Sardon, Krzysztof Pieliowski, Konstantinos N. Raftopoulos, *Thermal studies on pluripotent networks.*