



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

**7<sup>th</sup> INTERNATIONAL SEMINAR ON MODERN  
POLYMERIC MATERIALS FOR ENVIRONMENTAL  
APPLICATIONS**

including

Special Session

**‘Recent Advances in Polymer Nanocomposites and Hybrid Materials’**

Kraków, 15–17 May, 2019

# PROGRAM



7<sup>th</sup> INTERNATIONAL SEMINAR ON MODERN POLYMERIC MATERIALS  
FOR ENVIRONMENTAL APPLICATION

*SCIENTIFIC COMMITTEE*

Serge Bourbigot, Lille  
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Marek Kozłowski, Wrocław  
Piotr Król, Rzeszów  
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Marian Zaborski, Lodz  
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*ORGANIZING COMMITTEE*

Krzysztof Pielichowski – Chairman  
Elżbieta Czaja  
Tomasz Majka  
Paulina Radzik  
Jacek Wójcik

## 15 May (Wednesday)

- 17.00-19.30 Registration  
18.00-20.00 Welcome Party

## 16 May (Thursday)

- 09.00-09.20 **Opening of the Seminar:**
- Prof. Tadeusz Tatara, Vice-Rector for Science of the Cracow University of Technology,
  - Prof. Dariusz Bogdał, Dean of the Faculty of Chemical Engineering and Technology,
- Chairman:** Marek Kozłowski
- 09.20-09.50 Serge Bourbigot, J. Sarazin, G. Okayay, P. Tranchard, F. Samyn, M. Jimenez (KEYNOTE)  
*“Novel methods for characterizing intumescent polymeric materials upon burning”*
- 09.50-10.10 Andrzej Rybak, Renata Porębska, Robert Sekuła  
*“Environmentally-friendly polymer composites for application as electrical insulation in energy distribution devices”*
- 10.10-10.30 Marek Piątkowski, Julia Radwan-Pragłowska, Łukasz Janus, Aleksandra Sierakowska  
*“Biodegradable scaffolds based on fungal chitosan”*
- 10.30-10.50 Monika Flejszar, Paweł Chmielarz  
*“Synthesis of PBA brushes by grafting from silicon wafers via ATRP methods”*
- 10.50-11.10 **Coffee Break**

**Chairman:** Mária Omastová

11.10-11.40 Marek Pyda, Anna Czerniecka-Kubicka, Agata Drogoń  
(KEYNOTE)  
*“Physical aging of biodegradable polymers: polylactide and poly(3-hydroxybutyrate) by advanced thermal analysis”*

11.40-12.00 Chi Hu, Serge Bourbigot, Thierry Delaunay, Marion Collinet, Sophie Marcille, Gaëlle Fontaine  
*“Improvement of Polybutylene Succinate flame retardancy”*

12.00-12.20 Magdalena Maciejewska  
*“Organic zinc salts as pro-ecological activators for sulfur vulcanization of elastomers”*

12.25-13.50 **Lunch**

### **Special Session: ‘Recent Advances in Polymer Nanocomposites and Hybrid Materials’**

**Chairman:** James Njuguna

13.50-14.20 Ignazio Blanco (KEYNOTE)  
*“The rebirth of POSS: state of the art and future developments in polymer reinforcement”*

14.20-14.40 Rita Varga, Kristóf Molnár, Tordai Hedvig, Nagy Krisztina, Angéla Jedlovszky-Hajdú  
*“Poly(aspartic acid) based nano gel fibers for cell culturing”*

14.40-15.00 Ewa Szefer, Agnieszka Leszczyńska, Paulina Radzik, Krzysztof Pielichowski  
*“Surface modification of CNC with succinic anhydride under microwave radiation and its application for biopolyamide 10.10 nanocomposites”*

15.00-15.20 Dóra Noémi Barczikai, Anikó Tóth, Viktória Kacsari, Luca Laub, Gabriella Csík, Angéla Jedlovszky-Hajdú  
*“Synthesis and application of biocompatible poly(amino acid) meshes with antibacterial properties”*

15.20-15.40 **Coffee Break**

**Chairman:** Serge Bourbigot

15.40-16.10 S. Ingram, P. Jenkins, S. Siddique, S. Khan, A. Usman, K. Starost, A. MacPherson, P Bari, S Mishra, J. Njuguna (KEYNOTE)  
*“Graphene/epoxy fibre reinforced composites for impact performance structures”*

16.10-16.30 Kinga Pielichowska, Klaudia Król-Morkisz, Katarzyna Nowicka, Piotr Szatkowski  
*“Functionalized nanohydroxyapatite as thermal stabilizer for polyoxymethylene”*

16.30-16.50 Konstantinos N. Raftopoulos, Patrycja Tworzydło, Stefanos Koutsoumpis, Anna Grzybowska, Jan Ozimek, Edyta Hebda, Apostolos Kyritsis, Krzysztof Pielichowski  
*“Calorimetric and dynamic glass transition in POSS-containing polyurethane systems”*

17.00-19.00 **Poster session**

20.00 **Gala Dinner**

## 17 May (Friday)

**Chairman:** Ignazio Blanco

09.00-09.30 Janusz Datta, Patrycja Jutrzenka Trzebiatowska, Ewa Głowińska, Marcin Włoch (KEYNOTE)  
*“A new approach to thermo-chemical decomposition study of polyurethanes waste and examples of usage of the recovered intermediates”*

09.30-09.50 Maciej Guzik (INVITED)  
*“Production and applications of bacterially synthesized polymer – polyhydroxyalkanoate”*

09.50-10.10 Małgorzata Latos-Brózio, Anna Masek

*“Impregnation of biodegradable polyesters with substances of plant origin – chlorophyll and curcumin”*

10.10-10.30 Dominika Czachor, Barbara Pilch-Pitera, Małgorzata Walczak, Beata Mossety-Leszczak  
*“Environmental friendly coatings for painting substrates with low thermal resistance”*

10.30-10.50 Katarzyna Jankowska, Jakub Zdarta, Szymon Jędrzejak, Ewa Kijeńska-Gawrońska, Teofil Jesionowski  
*“Electrospun materials as supports for enzyme immobilization”*

10.50-11.10 **Coffee Break**

**Chairman:** Piotr Król

11.10-11.40 Mária Omastová (KEYNOTE)  
*“Polymeric composite nanofibers prepared by electrospinning for advanced application”*

11.40-12.00 Gernot Oreski (INVITED)  
*“Polymers in crystalline silicon photovoltaic modules: Challenges in material development and reliability assessment”*

12.00-12.20 Mária Gavendová, Vladimíra Krmelová, Tomáš Zatroch, Bibiana Bizubová, Michal Kleščík, Mária Straková  
*“Investigation of the various nucleating agents effect on the properties of pre-oriented polypropylene fibres”*

12.25-13.50 **Lunch**

**Chairman:** Aleksander Prociak

13.50-14.20 Theodora Krasia-Christoforou (KEYNOTE)  
*“Polymer-based fibrous mats in water remediation processes”*

14.20-14.40 M. Peñas-Caballero, J. Araujo-Morera, Saúl Utrera, M. Hernández-Santana, M. López-Manchado, R. Verdejo (INVITED)  
*“Self-healing polymer composites”*

14.40-15.00 Katarzyna Haraźna, Liliana Szyk-Warszyńska, Małgorzata Witko, Maciej Guzik  
*“Preparation and characterisation of bacterial polyester - polyhydroxyoctanoate (PHO) and its use for wound healing”*

- 15.00-15.20 Anna Kufel, Stanisław Kuciel  
*“Study on mechanical properties of basalt fibre reinforced polypropylene composites”*
- 15.20-15.40 **Coffee Break**
- Chairman:** Theodora Krasia-Christoforou
- 15.40-16.00 Szczepan Bednarz  
*“Renewable Polymers from Itaconic Acid: Synthesis and Structure”*
- 16.00-16.20 Monika Topa  
*“Novel efficient photoinitiating systems for dental light-cure composite resins”*
- 16.20-16.40 Maria Kurańska, Krzysztof Polaczek, Aleksander Prociak  
*“Modified used cooking oils as environmentally friendly reactive components for modern polymeric materials”*
- 16.40-17.00 Paweł Fiedor  
*“Novel UV-A and visible light photoinitiating systems dedicated for 3d printing”*
- 17.00-17.20 Krisztina Tóth, Dávid Juriga, Miklós Zrínyi, Gábor Varga, Angéla Jedlovsky-Hajdú, Krisztina Nagy  
*“Characterisation of poly(aspartamid) based nanofibrous dopamine conjugates”*
- 17.20-17.30 **Closing of the Seminar**

## Posters

1. Katarzyna Bialik-Wąs, Anna Ledwoń, Dagmara Malina, Klaudia Pluta, Tomasz Majka  
*Preparation and characterization of alginate/Aloe vera hydrogel films for biomedical applications*
2. Katarzyna Bialik-Wąs, Karolina Banak, Dagmara Malina, Krzysztof Pielichowski  
*Studies on the influence of the environment on the drug release from PHAs nanocarriers*
3. Artur Bukowczan, Edyta Hebda, Sławomir Michałowski, Krzysztof Pielichowski  
*Modification of flexible polyurethane foams based on tolylene-2,4-diisocyanate by polyhedral oligomeric silsesquioxanes (POSS)*
4. Dominika Czachor, B. Pilch-Pitera, K. Tabin, P. Biedka, Ł. Byczyński, M. Kisiel, M. Dutkiewicz  
*Anti-corrosion and chromium-free powder clear coatings*
5. Ewelina Chmiel, Jacek Lubczak  
*Polyurethane foams with 1,3,5-triazine ring, silicon and boron atoms*
6. Ewelina Chmiel, Marzena Szpiłyk, Jacek Lubczak  
*Thermostable polyurethane foams with 1,3,5-triazine ring and silicon atoms*
7. Anna Czerniecka-Kubicka, Wiesław Frącz, Marek Pyda  
*The quantitative thermal analysis of biodegradable nanocomposites based on poly(3-hydroxybutyrate)*
8. Teresa Czytajło, Sławomir Michałowski  
*Effect of nanosilica on selected properties of polyurethane elastomers*
9. Anna Drabczyk, Sonia Kudłacik-Kramarczyk, Magdalena Głąb, Bożena Tylińczak  
*Studies on the release of the active substance from polymeric drug carriers*
10. Anna Drabczyk, Magdalena Kędzierska, Sonia Kudłacik-Kramarczyk, Bożena Tylińczak  
*Functionalized magnetic nanoparticles for application in anticancer treatment*
11. Agata Drogoń, Marek Pyda  
*Physical aging of biodegradable polylactide*
12. Karolina Dzieciółowska, Joanna Ortyl, Anna Chachaj-Brekiesz, Monika Topa  
*Derivatives of Coumarin as Fluorescent Probes for Monitoring Photopolymerization Processes by Fluorescence Probe Technology*
13. Anna Dziemidkiewicz, Magdalena Maciejewska



- Novel environmentally friendly curing system for brominated butyl rubber*
14. Monika Flejszar, Paweł Chmielarz, Karol Wolski, Gabriela Grześ  
*Grafting of PBA and PHEA brushes from silicon wafer surfaces via SARA ATRP*
  15. Monika Flejszar, Paweł Chmielarz, Karol Wolski, Gabriela Grześ  
*Synthesis of PNIPAM polymer brushes via surface initiated SARA ATRP in aqueous media*
  16. Wioletta Florkiewicz, Dagmara Malina, Klaudia Pluta, Agnieszka Sobczak-Kupiec  
*Silver nanoparticles preparation with the use of Cistus incanus*
  17. Dorota Głowacz-Czerwonka  
*Oligoetherols with an azacyclic ring as substrates for obtaining polyurethane foams with reduced flammability*
  18. Dorota Głowacz-Czerwonka  
*Polyurethane foams containing oligoetherol based on a reactive solvent of melamine: synthesis and flammability studies*
  19. Alicja Gruchała, Emilia Hola, Joanna Ortyl  
*The response of terphenyl derivatives to changes of medium polarity and microviscosity during cationic and free-radical polymerization of a monomers*
  20. Emilia Hola  
*Terphenyl derivatives as highly versatile co-initiators/sensitizers for photopolymerization upon exposure to visible light*
  21. Katarzyna Jankowska, Jakub Zdarta, Adam Grzywaczyk, Ewa Kijewska-Gawrońska, Teofil Jesionowski  
*Electrospinning method in biodegradation of pollution from aqueous solutions*
  22. Magdalena Jankowska, Joanna Ortyl, Mariusz Galek, Emilia Hola  
*New highly efficient photoinitiating systems for cationic and radical photopolymerization reactions under soft conditions*
  23. Łukasz Kłapiszewski, Karol Bula, Teofil Jesionowski  
*Inorganic-organic hybrid materials as pro-ecological polymer fillers*
  24. Piotr Król, Bożena Król, Łukasz Uram, Kinga Pielichowska, Marta Sochacka-Piętal, Małgorzata Walczak  
*The study of biological properties of polyurethane elastomers for medical applications*
  25. Sonia Kudłacik-Kramarczyk, Magdalena Kędzierska, Anna Drabczyk, Bożena Tyliszczak  
*The impact of the reaction conditions of the synthesis of albumin based drug carriers on the properties of obtained carriers*
  26. Sonia Kudłacik-Kramarczyk, Magdalena Kędzierska, Anna Drabczyk, Magdalena Głąb, Bożena Tyliszczak  
*Preparation of wound dressings based on polysaccharides and proteins*
  27. Aleksandra Lach, Katarzyna Nowicka, Kinga Pielichowska

- Polyurethane-based multifunctional bone cements modified with magnetic nanoparticles*
28. Aleksandra Lach, Aleksandra Pietrucha, Izabela Trzeciecka, Kinga Pielichowska  
*Gellan gum-based hydrogels modified with graphene oxide and hydroxyapatite for cartilage tissue regeneration*
29. Dominik Szczęch, Renata Lubczak, Marzena Szpiżyk  
*Comparison of properties of polyurethane foams obtained from various oligoetherols with starch units*
30. Dominik Szczęch, Renata Lubczak, Rafał Oliwa, Marzena Szpiżyk  
*Flame retardance of polyurethane foams with starch units*
31. Monika Witek, Agnieszka Świętoń, Tomasz M. Majka  
*Tear resistance determination of two paper surfaces adhesively bonded with fast polylactide adhesives (FPA)*
32. Klaudia Złotowska, Magdalena Kulig, Tomasz M. Majka  
*Influence of pyrolysed filler on recycled PET flammability*
33. Elżbieta Malewska, Maria Kurańska, Aleksander Prociak  
*Synthesis and properties of bio-polyols obtained by transamidation of waste cooking oil*
34. Anna Marzec, Bolesław Szadkowski, Jacek Rogowski, Marian Zaborski  
*Characterization and properties of new hybrid pigments based on aluminum-magnesium hydroxycarbonate and azo dye*
35. Olga Mielcarek, Anna Masek  
*Composites of Epoxidized Natural Rubber (ENR) and Polycaprolactone (PCL) Containing Cellulose Fibres and Modified Montmorillonite*
36. Olga Mielcarek  
*The effect of photo-aging process on surface energy of aliphatic polyesters stabilized with flavonoids*
37. Joanna Ortyl, Wiktoria Tomal, Patryk Szymaszek  
*Photopolymerization of Cationic and Free-radical Monomers under Visible Light Using New Photoinitiating Systems*
38. Jan Ozimek, Edyta Hebda, Krzysztof Pielichowski  
*The influence of POSS molecules on phase separation of linear polyurethanes based on polyols with different molecular weight*
39. Joanna Pagacz, Artur Oziębło  
*Bioinspired materials – state of the art and brief presentation of future trends*
40. Klaudia Ordon, Justyna Sasiak, Monika Szlachta, Kinga Pielichowska  
*Polyurethanes chemically modified with sodium alginate for biomedical applications*
41. Maciej Pilch, Joanna Ortyl, Anna Chachaj-Brekiesz, Roman Popielarz  
*Stability study of new europium(III) complexes for the role of highly selective luminescent sensors for monitoring the temperature of the system*

42. Paulina Radzik, Ewa Szefer, Agnieszka Leszczyńska, Krzysztof Pielichowski  
*The influence of the nanocellulose filler on selected properties of CNC/PA10.10 biocomposites*
43. Ewa Szefer, Agnieszka Leszczyńska, Paulina Radzik, Krzysztof Pielichowski  
*Biocomposites of polyamide and surface modified cellulose nanocrystals*
44. Anna Sienkiewicz, Piotr Czub  
*Bio-based fillers for polymer composites*
45. Agnieszka Sobczak-Kupiec, Wioletta Florkiewicz, Dagmara Malina, Klaudia Pluta, Bożena Tyliczszak  
*Silver nanoparticles preparation with the use of Silybum marianum*
46. Anna Sowińska, Magdalena Maciejewska  
*Proecological rubber composites with reduced content of zinc*
47. Łukasz Szajnecki, Magdalena Sobiesiak  
*Application of superabsorbents based on crosslinked poly(sodium acrylate) in control release systems*
48. Magdalena Sobiesiak, Barbara Gawdzik, Łukasz Szajnecki  
*Dynamic sorption of heavy metal ions on DVB-GMA based porous polymers*
49. Piotr Stachak, Edyta Hebda, Krzysztof Pielichowski  
*Nanostructured hybrid composites: non-isocyanate polyurethane/functionalized POSS*
50. Bolesław Szadkowski, Anna Marzec, Marian Zaborski  
*Effect of hybrid pigment based on hydrotalcite and azo chromophore on the properties and stability of ethylene-norbornene composites*
51. Piotr Szatkowski, Alina Ragan, Kinga Pielichowska  
*The influence of different cellulose forms on the properties of polyurethane matrix composites*
52. Piotr Szatkowski, Monika Szlachta, Klaudia Ordon, Kinga Pielichowska  
*Preparation and properties of polyurethanes chemically modified with chitosan*
53. Evelin Sipos, Miklós Zrínyi  
*Mechanical properties of planar fibrous networks*
54. Piotr Szymaszek, Joanna Ortyl, Paweł Fiedor, Anna Brekiesz-Chachaj, Maciej Pilch  
*Applicability of Selected 2-amino-4,6-diphenyl-pyridine-3-carbonitrile Derivatives for Monitoring of Free-radical and Thiol-ene Photopolymerization by Fluorescence Probe Technology*
55. Wiktoria Tomal, Joanna Ortyl  
*High performance photoinitiating systems dedicated to photocurable coatings*
56. Konstantinos N. Raftopoulos, Patrycja Tworzydło, Jan Ozimek,

- Panagiotis Klonos, Edyta Hebda, Apostolos Kyritsis, Krzysztof Pielichowski  
*Calorimetric and Dynamic Glass Transition in Polyurethanes with Flexible Hard Segments cross-linked with POSS*
57. Izabela Łukaszewska, Konstantinos N. Raftopoulos, Artur Bukowczan, Edyta Hebda, Apostolos Kyritsis, Krzysztof Pielichowski  
*Calorimetric and Dynamic Glass Transition in Biocompatible Polyurethane Elastomers Based on Amphiphilic Soft Segments*
58. Bożena Tylińczak, Sonia Kudłacik-Kramarczyk, Anna Drabczyk, Magdalena Głąb, Katarzyna Chorążka  
*Swelling ability and pharmacological properties of chitosan-based hydrogels modified with natural substances*
59. Bożena Tylińczak, Sonia Kudłacik-Kramarczyk, Anna Drabczyk, Magdalena Głąb, Katarzyna Chorążka  
*The impact of the modification of chitosan based matrices on the mechanical properties of polymeric materials*
60. Aleksander Prociak, Katarzyna Uram, Maria Kurańska, Sławomir Michałowski  
*New bio-based polyols for application in polyurethane systems*
61. Joanna Wojturska, Renata Hyla  
*Chemical resistance of vegetable oil based polyurethane coating materials*
62. Natalia Złocista-Szewczyk, Aleksandra Matusiak, Kinga Pielichowska  
*Polymer hydrogels based on modified sodium alginate for cartilage tissue regeneration*
63. Natalia Złocista-Szewczyk, Bartosz Lizoń, Kinga Pielichowska  
*Modified Gellan gum as a potential material for orthopedic application*
64. Vladimíra Krmelová, Mária Gavendová, Tomáš Zatroch, Jan Krmela, Andrej Dubec, Bibiana Bizubová  
*Structure and properties of polypropylene fibres with calcium carbonate*
65. Alexander Schindler, Krzysztof Hodor  
*Identify – Innovative Proteus<sup>®</sup> Software*