

February 2021

**INSTITUTE FOR POLYMER RESEARCH (IPR)
UNIVERSITY OF WATERLOO
WATERLOO, ONTARIO N2L 3G1**

NEWSLETTER 2020

1. NOTE FROM PROFESSOR JEAN DUHAMEL, IPR DIRECTOR

What a year 2020 will have been! For the first time in 42 years, our annual IPR Symposium, which was supposed to take place on May 6, 2020 had to be cancelled! As an avid attendee of the symposium, who came to every IPR Symposium since 1996 when I joined the University of Waterloo, the cancelling of the 42nd IPR symposium traditionally held at Conrad Grebel College was shocking news, and that it happened under my watch as the current IPR Director did not make it an easier decision to take! Fortunately, improvements in the electronic platforms, that allow us to remain connected with friends and colleagues through our computers, came to our rescue. We were able to repackage the IPR Symposium into a virtual format and the 42nd IPR Symposium was held remotely on September 2nd, 2020. While there was tremendous anxiety leading to the symposium day regarding to feasibility of holding such an event on-line, this virtual symposium ran surprisingly smoothly. Presenters gave their talk remotely, sometimes from abroad, and from the feedback that Colleen and I received after the symposium, the virtual format of the annual IPR Symposium seems to have been successful. This success in transitioning the IPR Symposium, and all other activities associated with the IPR, from a physical to a virtual format will most certainly lead to some interesting discussions as we move forward past the pandemic, as to whether some of these critical changes, that were implemented because of COVID, should or should not be maintained in the future!

In any case, 20 graduate students gave oral presentations during the virtual version of the 42nd IPR Symposium. Graduate students Chunxia Tang (Chem. Eng.) from Michael Tam's laboratory and Janine Thoma (Chem.) from my laboratory were the 2020 IPR Awardees. They gave two very interesting presentations on the use of functionalized cellulose in the removal of heavy metal ions and the determination of the persistence length in polymeric bottle brushes. The symposium had a solid attendance from academia and industry and we certainly thank our industrial members for their continued participation despite the new virtual character of the symposium.

Beside the symposium, our students continued to contribute informative presentations as part of our IPR Student Presentation Series. Natun Dasgupta (Chem.) from Mario Gauthier's group gave a lecture on thermoresponsive polymers, Pengxiang Si (Chem. Eng.) from Boxin Zhao's laboratory gave an introduction to water-based polyurethane, Remi Casier (Chem.) from my laboratory reviewed some important concepts in protein folding. We were also most fortunate to have a presentation by Prof. Vivaldo Lima from the National Autonomous University of Mexico (UNAM), who gave a beautiful introduction on "Polymer Production and Modification in Supercritical Carbon Dioxide from a Chemical Engineering Perspective" on February 14th, 2020.

One major administrative achievement to report in 2020 was certainly the renewal of the “Institute Status” of the IPR by the senate of the University of Waterloo. This task, which takes place on a 5-yr cycle, is of critical importance to the institute and its undertaking in a COVID environment resulted in some interesting challenges. Nevertheless, I am very happy to report that all challenges were overcome, thanks to the tremendous help from Colleen and the IPR community, and the IPR institute status was renewed with flying colors!

Among other highlights of this difficult year, Prof. Mario Gauthier continues to represent the IPR on the international stage as recipient of the High-end Foreign Experts Program Award with Wuhan in the Hubei Province (China).

Our members also contribute to the publication of important and novel achievements in polymer research through their editorial responsibilities. Profs. Penlidis and Vivaldo Lima are both serving on the editorial board of *J. Macromol. Sci.- Pure Appl. Chem.* and Prof. Penlidis serves also on the editorial board of *Appl. Chem. Polymer-Plastics Techn. and Eng., Macromol. React. Eng., and Processes*. Prof. Feng is an editorial board member of *J. Membrane Sci., Sep. Purif. Technol., J. Eng. Sci. (Pakistan), J. Membrane Sci. Res., and J. Technol. (Malaysia)*. Prof. Yuning Li serves as an editorial board member of *Intl. J. Nano Stud. Technol., Electronics, AIMS Env. Sci., Adv. Nanopart.* Prof. Tam is an associated editor for *ACS Sustain. Chem. Eng.*; Prof. Tzoganakis serves on the editorial board of *Adv. Polym. Technol.* Profs. Jean Duhamel is an associate editor with *Polymers* and will serve as a Guest Editor of a special issue on the “Chemical and Physical Properties of Polysaccharides and their Derivatives” to be published in 2021. In 2020, Prof. Jean Duhamel was a member of the editorial advisory board of *Macromolecules*.

Among the upcoming important events regarding the IPR for 2021, May 5th, 2021 is when our 43rd IPR Symposium will be held under a virtual format. Prof. Eduardo Vivaldo-Lima from UNAM, Mexico, will be our keynote speaker. We most certainly look forward to your attendance in what represents the cornerstone of the IPR activities for promoting most exciting polymer research

2. ANNUAL IPR SYMPOSIUM

The 43rd Annual IPR Symposium will be held May 5th, 2021. A schedule and registration forms will be circulated electronically.

Many thanks to all who participated in the 2020 Symposium. IPR received very positive feedback regarding the topics covered. The 2020 program and the list of industrial participants are attached (Appendix 1).

3. IPR INDUSTRIAL MEMBERS

An up-to-date list of our current industrial members is attached (Appendix 2).

4. IPR PREPRINTS

During 2020, the IPR office sent out 38 preprints to our members (Appendix 3).

5. RESEARCH PROGRAMS

We have more than 90 research personnel (excluding faculty) involved in polymer research at the University of Waterloo. Industrial members may find it interesting to keep up to date with the various research projects that are underway (see list attached of research personnel, Appendix 4). For more information on any project, please email/call the appropriate supervisor or the IPR office at <ipr@uwaterloo.ca>, 519/888-4789.

6. RECENTLY GRADUATED STUDENTS

J. Duhamel

PhD	Chem	Li, L.	Characterization of Polysaccharides in Solution Using Fluorescence Techniques
MSc	Chem	Frasca, F.	Characterization of PIBSI Dispersants and their PIBSA Component by Pyrene Excimer Fluorescence

X. Feng

MASc	ChE	Alsaadi, F.	Reverse osmosis membranes for desalination of brackish water
PhD	ChE	Chen, S.	Poly(ether-b-amide)-based composite membranes for carbon capture from gas streams

M. Gauthier

PhD	Chem	Worku, A.	Arborescent Micelles from Polyelectrolyte Complexes
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Y. Li

MASc	ChE	Li, W.	Conjugated Polymers Having Indolin-2-one Side Chains for Organic Electronics
MASc	ChE	Wang, G.	A new series of semiconducting azine polymers and their applications in organic electronics
MASc	ChE	Guo, C.	Study of the Influence of Different Electrolyte Salts on the Performance of Lithium-Sulfur Batteries
MASc	ChE	Kumar, P.	On the Influence of Dielectric Constant and Processing Conditions in Organic Solar Cells

T. Mekonnen

MASc	ChE	Saikrishnan,S.	Investigation of Thermo-mechanical degradation of polypropylene – low density polyethylene blends
MASc	ChE	Jardin, J.	Cellulose Nanocrystal Hybrids as Reinforcing and Antimicrobial Agents in Rubber Nanocomposites
MASc	ChE	Panchal, P.	Utilization of Renewable Polymers for Functional Applications
MASc	ChE	Ly, M.	Hydrophobic Modifications of Cellulose Nanocrystals for Anticorrosion and Polymer Coating Applications

A. Penlidis

PhD	ChE	Scott, A.	Design of Polymeric Materials:Novel Functionalized Polymers for Enhanced Oil Recovery & Gas Sorption Applications
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D. Schipper

PhD	CHEM	Selmani, S.	Simultaneous Sorting and Alignment of Single-Walled Carbon Nanotubes
PhD	CHEM	Sinclair, G.	Copper Mediated Tandem C-H Bond Functionalization/C-S Bond Formation
PhD	CHEM	Kulak, M.	Simultaneous Sorting and Alignment of Single-Walled Carbon Nanotubes
MSc	CHEM	Wang, S.	Magnetic Fields Applied to the Alignment Relay Technique
MSc	ChEM	Mathers, S.	Directed Oxidations to Access Highly Oxidized Conjugated Materials

M. Tam

PhD	ChE	Grishkewich, N.	Sustainable nanomaterials for water treatment
MASc	ChE	Kim, D.	Control of sea lice in salmon using CNCs
MASc	ChE	Jardin, J.	Antimicrobial CNCs for rubber gloves
MASc	ChE	Han, L.	Antimicrobial CNCs for various applications
MASc	ChE	Dutchmann, C.	Copper loaded CNCs as antimicrobial agents

C. Tzoganakis

MASc	ChE	Ngunjiri, R. .	Effect of UV Radiation on the Mechanical and Rheological Properties of LLDPE and HDPE Films
MASc	ChE	Saikrishnan, S.	Investigation of Thermo-mechanical Degradation of Polypropylene-Low Density Polyethylene blends exposed to simulated recycling

E. Vivaldo-Lima

M.Eng	Meng	Benitez-Carreón, A.	New Aspects on the Modeling of Dithiolactone-Mediated Radical Polymerization of Vinyl Monomers
PhD	ChE	Lopez-Dominguez, P.	Modeling of reversible deactivation radical copolymerizations carried out in supercritical carbon dioxide

B. Zhao

PhD	ChE	Yang, F.	Polymer Gels as Functional Soft Solids
PhD	ChE	Si, P.	Water Based Polyurethane Multi-Functional Composites
MASc	ChE	Krishna, S.	Evaluation of antimicrobial coatings in wet conditions and development of SPEEK– copper composites for antimicrobial applications
MASc	ChE	Nwaiwu, J.	Development of Alternative Protocols for Antimicrobial Efficacy Testing of Antimicrobial Surfaces

7. ACADEMIC MEMBERS OF THE INSTITUTE FOR POLYMER RESEARCH

Professors:

R. Dhib	Chem. Eng.	Ryerson
T.A. Duever	Chem. Eng.	Ryerson
J. Duhamel, Director	Chemistry	Waterloo
X. Feng	Chem. Eng.	Waterloo
J. Forrest	Phys. Astro.	Waterloo
M. Gauthier	Chemistry	Waterloo
Y. Li	Chem. Eng.	Waterloo
N. McManus	Chem. Eng.	Waterloo
T. Mekonnen	Chem. Eng.	Waterloo
A. Penlidis	Chem. Eng.	Waterloo
D. Schipper	Chemistry	Waterloo
L. Simon	Chem. Eng.	Waterloo
M. Tam	Chem. Eng.	Waterloo
C. Tzoganakis	Chem. Eng.	Waterloo
E. Vivaldo-Lima	Chem. Eng.	UNAM, Mexico
X. Wang	Chemistry	Waterloo
B. Zhao	Chem. Eng.	Waterloo

For a brief description of research interests and projects, along with contact information, please visit the following web link: www.uwaterloo.ca/institute-polymer-research/

8. MEMBER COMPANIES—2020

Currently we have **7 member companies**: (refer also Appendix 3)

Afton

Compuplast Canada Inc.

Lanxess Inc.

Mondelez Inc.

Synothomer Inc.

PolyVation, The Netherlands

Princeton Polymer Consultants, USA

9. STUDENT AWARDS

T. Mekonnen

Ewomazino Ojogbo- The NSERC Postgraduate Scholarships – PhD (2020- 2023)

A. Penlidis

Bhoomi Mavani, Mitacs RTA (Research Training Award), July 1 – Oct 30, 2020

Alison J Scott, Department of Chemical Engineering Award in Proficiency in Research (Park Reilly Medal), Nov 2020

M. Tam

Chunxia Tang- WIN Fellowship

B. Zhao

Fut Yang & Aleksander Cholewinski, Boxin Zhao
Chemical Engineering Best Publication Award For: “work on a novel class of smart materials with record stiff-changing performance, which opens a new paradigm in material design.”

10. FACULTY AWARDS

E. Vivaldo-Lima

Awardee of the “Distinguished International Visiting Scholar Program (DIVS)”, University of Waterloo, Waterloo, Ontario, Canada, November de 2020 (late decision and communication due to COVID-19).

Boxin Zhao

Fut Yang & Aleksander Cholewinski, Boxin Zhao
Chemical Engineering Best Publication Award For: “work on a novel class of smart materials with record stiff-changing performance, which opens a new paradigm in material design.”

11. FULL REFEREED JOURNAL PAPERS

J. Duhamel

Little, H.; Wang, J.; Duhamel*, J.; Li, X.; Nagula, M.; Maurizot*, V.; Huc*, I. Simplification in the Acquisition and Analysis of Fluorescence Decays Acquired with Polarized Emission for Time-Resolved Fluorescence Anisotropy Measurements. *Anal. Chem.* **2020**, *92*, 668-673.

Casier, R.; Duhamel*, J. The Effect of Like-Charges on the Conformation and Internal Dynamics of Polypeptides Probed by Pyrene Excimer Fluorescence. *Macromolecules* **2020**, *53*, 5147-5157.

Casier, R.; Duhamel*, J. The Effect of Structure on Polypeptide Blobs: A Model Study Using Poly(L-Lysine). *Langmuir* **2020**, *36*, 7980-7990.

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Li, L.; Duhamel*, J. Interior of Amylopectin and Nanosized Amylopectin Fragments Probed by Viscometry, Dynamic Light Scattering, and Pyrene Excimer Formation. *Polymers* **2020**, *12*, 2649.

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T. Mekonnen

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13. CONFERENCE PRESENTATIONS/INVITED SEMINARS

J. Duhamel

Structure and Dynamics of Synthetic and Biological Macromolecules Characterized in Solution by Pyrene Excimer Fluorescence (PEF). Duhamel, J. University of Saskatchewan, Saskatoon, October 9th, 2020.

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X. Feng

X. Feng, “Pressure swing permeation for gas separation,” Invited Keynote presented at the Canadian Chemical Engineering Conference, Ottawa, ON, Oct 26-30, 2020.

X. Feng, “Membrane technologies for clean water and environment,” Plenary Lecture presented at the International Conference on Engineering Sciences and Technologies for Environmental Care, Jorhat, India, Feb 20-22, 2020.

M. Gauthier

Simposio de Tendencias Actuales de la Química, February 2020, Chihuahua, Mexico.
“Almidón Injertado con Polímero Termosensible Para la Recuperación de Petróleo de Arena Bituminosa”

Instituto de Investigación en Materiales, Universidad Nacional Autónoma de México, Unidad Morelia, January 2020, Morelia, Mexico. “Membranas Para la Extracción de Metales Pesados del Agua: Cómo la “Vieja Química” Puede Ayudar a Resolver un Nuevo Problema”

Instituto Tecnológico de Toluca, February 2020, Metepec, Mexico.
“Complejos de Hierro Estabilizados con Almidón para la Degradación Fotocatalítica de Colorantes”

M. Tam

Tam, K.C., Cellulose Nanocrystals: A Promising Sustainable Nanomaterial for Advanced Engineering, Institute of Materials Science & Engineering, Agency for Science and Technology Research, Singapore, Webinar, 14 July 2020

A. Penlidis

Scott, A.J. and A. Penlidis (2020). Prescriptions to inform the design of polymeric materials. Mon, Oct 26, 2020, session A2 (PRE), 2:00-2:20 pm. 70th CSChE Conf., Ottawa, ON, Canada, Oct. 25-28, 2020. **Invited presentation.**

Y. Li

Y. Li Novel side chain engineering of polymer donors to realize high-performance and low-cost organic solar cells, CSChE CCEC 2020 Virtual: October 26-30

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Y. Li (invited), Enabling polymer materials for printed electronics, The 4th SUN-WIN Bilateral Workshop, Soochow University, Soochow China, on December 3, 2019.

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E. Vivaldo-Lima

"Polymer Production and Modification in Supercritical Carbon Dioxide from a Chemical Engineering Perspective", **invited seminar**, Institute for Polymer Research, Department of Chemical Engineering, IPR Winter Seminar Series, University of Waterloo, Waterloo, Ontario, Canada, February 14, 2020.

B. Zhao

Boxin Zhao, Biomimetic Interface and Shape Changing Polymers for Soft Robotic Devices, 5th International Bio-inspiration & 2nd International Optics N.I.C.E. conference - Oct. 12-14, 2020 in Nice – France (**Keynote speech**)

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A-Reum Kim*, Sushanta K. Mitra, Boxin Zhao, “Sliding Dynamics of Lubricated Contact of Soft Materials”, Proceedings of 43th Annual Meeting of The Adhesion Society, Charleston, South Carolina, USA, Feb. 23– 26, 2020

14. PATENTS/MAJOR TECHNICAL REPORT/CHAPTERS IN BOOKS/OTHER

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X. Feng, I.G. Towe, A. Hamza and J. Perez, “Supplying liquid material to the membrane,” Japan Patent JP6681856 (issued Apr 15, 2020).

Y. Li

Yuning Li, US Provisional patent application #63/102,296 for “Polymer semiconductors containing acrylyl-like side chain and their devices”, filed on 6/8/2020.

M. Tam

Process for Preparing Amine-functionalized Cellulose Nanocrystals and Nitrogen Doped Carbon Nanofibers, by Shi Z, Wu, X, Tam, KC, Berry, RM, US10676846B2, US Patent awarded on 9 June 2020.

E. Vivaldo-Lima

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Mexican patent MX/a/2013/009053, “Polímeros con estructura de red de baja densidad y proceso de obtención de los mismos mediante polimerización radicalica por desactivación reversible en fluidos comprimidos” (Low density polymer networks and their production process by reversible deactivation radical polymerization in compressed fluids), E. Vivaldo-Lima, M. J. Bernad Bernad, A. Licea-Claverie, H. Vázquez-Torres, P. Pérez-Salinas, A. Rosas-Aburto; Date of application: 6/August/2013; **Date granted: 13/08/2020 (Filing certificate: MX/E/2020/029514; Title: 377687).**

B. Zhao

Boxin Zhao, Biomimetic Interface and Shape Changing Polymers for Soft Robotic Devices, 5th International Bio-inspiration & 2nd International Optics N.I.C.E. conference - Oct. 12-14, 2020 in Nice – France (**Keynote speech**)

Boxin Zhao, Biomimetic Interfacial Engineering for Advanced Manufacturing”, National University of Singapore, Jan 9, 2020

Boxin Zhao, “Smart polymer and bio-nanomaterials for advanced electronics and soft robotics”, South University of Science and Technology, Shenzhen, China, Jan 7, 2020

Pengxiang Si, Boxin Zhao, “Poly methacrylic acid sodium salt (PMANa)/Polyurethane (PU) Latex-Polyelectrolyte Colloid Systems Enabling One-Pot Fabrication of Non-periodic Structured Mechanoresponsive Smart Windows”, 70th Canadian Chemical Engineering Conference (virtual), Oct. 26-30, 2020

A-Reum Kim*, Sushanta K. Mitra, Boxin Zhao, “Sliding Dynamics of Lubricated Contact of Soft Materials”, Proceedings of 43th Annual Meeting of The Adhesion Society, Charleston, South Carolina, USA, Feb. 23– 26, 2020

15. OTHER HIGHLIGHTS FOR YEAR 2020

Prof Penlidis acted as journal reviewer for 19 manuscripts, and one major funding proposal.

Prof Penlidis acted as consultant for 7 companies (Canada, USA and Europe).

Prof. Penlidis hosted at Waterloo Prof. Eduardo Vivaldo-Lima, UNAM, Mexico, as a visiting scholar (sabbatical leave from UNAM) from Aug 1, 2019-July 31, 2020. Prof. Vivaldo-Lima was the recipient of a Distinguished International Visiting Scholar (DIVS) Award at the University of Waterloo.

Prof Penlidis served on the editorial boards of the following journals: Polymer-Plastics Techn. and Eng.; Macromol. React. Eng. Processes (considerable work as editorial board member promoting special issues, organizing surveys and adjudicating for editor).

Professor Penlidis' 2020 International/national academic collaborations (regular basis with co-authored articles): UNAM (Mexico), Iran (Paints/Coatings Institute) and, more locally, University of Ottawa, UNB, and Ryerson Polytechnic Univ.).

Professor Tam became the Associate Editor, ACS Sustainable Chemistry & Engineering

Prof. Vivaldo-Lima continued serving on the editorial board of J. Macromol. Sci.-Pure Appl. Chem.

Prof. Vivaldo-Lima completed a one-year appointment as Visiting Professor at the Department of Chemical Engineering of the University of Waterloo, working in Prof. Penlidis' group on the modeling of polymer branching and reversible deactivation radical polymerization. The appointment started on August 1, 2019 and finished on July 31, 2020.

Prof. Vivaldo-Lima continued his membership in the UK Research and Innovation International Development Peer Review College (UK, 2018 to present). He evaluated two projects for two calls of the Engineering and Physical Sciences Research Council (EPSRC) of UK.

Prof. Vivaldo-Lima served as Guest Editor of a special issue entitled "Modeling and Simulation of Polymerization Processes" for Processes, a journal from MDPI. Details about the special issue: https://www.mdpi.com/journal/processes/special_issues/polymerization_processes.

Prof. Vivaldo-Lima continued his participation as member of the Professors Evaluation Committee (Comisión Dictaminadora) of the area of Chemical Engineering of FES-Zaragoza UNAM, 2018 to present.

Prof. Vivaldo-Lima continued his role as Patron (Benefactor) of Faculty of Chemistry-UNAM, 2018 to present.

Prof. Vivaldo-Lima acted as journal reviewer/adjudicator for 10 manuscripts in 6 different journals.

Prof. Vivaldo-Lima served as external reviewer and jury member for a PhD Thesis entitled "KINETICS AND MODELING OF RADICAL COPOLYMERIZATION OF WATER-SOLUBLE CATIONIC MONOMERS", presented by Ikenna Henry Ezenwajiaku, and defended on January 27, 2020, at Queen's University, Kingston, Ontario, Canada.

Prof. Zhao became a member of the Waterloo Institute for Nanotechnology (WIN) Board of Directors

Prof. Zhao was a Guest Editor – MDPI Polymers Special Issue: Polymer Adhesion and Interfaces for Advanced Manufacturing", with co-guest Editors: Prof. Li Yu and Prof. Marco Alfano.

**INSTITUTE FOR POLYMER RESEARCH
 CELEBRATING 35 YEARS OF OFFICIAL INSTITUTE STATUS
 FORTY-SECOND ANNUAL SYMPOSIUM
 ON POLYMER SCIENCE/ENGINEERING 2020
 University of Waterloo, Waterloo, Ontario
 Wednesday, September 2, 2020**

12:50	Welcome and Opening Remarks
1:00 – 1:20	<p>Janine Thoma [Prof. Duhamel] Persistence Length of Polymeric Bottle Brushes Determined by Pyrene Excimer Fluorescence (Winner of 2020 IPR Award for Academic Excellence in Polymer Science/Engineering)</p>
1:20 – 1:40	<p>Elnaz Esmizadeh [Prof. Mekonnen] Degradation behavior of polypropylene during reprocessing and its biocomposites: thermal and oxidative degradation kinetics</p>
1:40 – 2:20	<p><u>5-Min. Mini Presentations</u></p> <ol style="list-style-type: none"> 1) Sainiwetha Saihrishnan [Prof. Mekonnen] Thermo-mechanical Degradation of Polypropylene-Low Density Polyethylene blend system after multiple extrusion 2) Javan Buratynski [Prof. Schipper] Using Degradable Polymers to Separate Carbon Nanotubes 3) Abdullah Ba Salem [Prof. Duhamel] Determination of Aggregation Number for Pyrene-labeled Gemini Surfactants 4) Kristijan Lulic [Prof. Duhamel] Self-Association of Oligoquinoline Foldamers Probed by Fluorescence Anisotropy 5) Hunter Little [Prof. Duhamel] Progress in Instrumentation for Time-resolved Fluorescence Anisotropy 6) Franklin Frasca [Prof. Duhamel] Relating Pyrene Excimer Fluorescence to Conformation in Pyrene-Labeled Polyamines 7) Tiana Trumpur [Prof. Forrest] Solvent Induced Nanoscopic Roughness on Glassy Polymer Thin Films 8) Minghui Liu (Prof. Zhao) Antimicrobial Activity of Quaternary Ammonium Compound/Polyurethane [QAC/PU] Colloidal Complex Film Based on Synergetic Release Killing and Contact Killing Mechanisms
2:20 – 2:40	<p>Remi Casier [Prof. Duhamel] Copolymerization and its Effects on Polymer Dynamics in Solution</p>
2:40 – 3 :00	Break

Mini-Symposium on Modification, Characterization, and Applications of Polysaccharides

- 3:00 - 3:20 **Chunxia Tang [Prof. Tam]**
Functionalized Cellulose Aerogel Beads for Heavy Metal Ions Removal (**Winner of the 2020 IPR Award for Academic Excellence in Polymer Science/Engineering**)
- 3:20 – 3:40 **Natun Dasgupta [Prof. Gauthier]**
Thermoresponsive Starch Nanoparticles for Oil Recovery from Tar Sands
- 3:40 – 4:00 **5-Min. Mini Presentations**
- 9) **Maryam Bagheri [Prof. Simon]**
Polysaccharide-Ionic Liquid corrosion inhibitors
- 10) **Ewomazino Ojogbo [Prof. Mekonnen]**
Effects of fabrication method on the dispersion of CNCs in highly crosslinked rubber composites
- 11) **Sanjay Patel [Prof. Duhamel]**
Pyrene-labeled Starch Nanoparticles as Fluorescent Sensors for Explosive Detection
- 12) **Donghan Liu [Prof. Duhamel]**
Synthesis and Characterization of Furan Based Non-ionic Surfactant (FBNIOS)
- 4:00 – 4:20 **Joanne Fernandez [Prof. Gauthier]**
Grafting of Starch Using a Complex Initiation System of CAN-KPS
- 4:20 – 4:40 **Muhammad Shahidul Islam [Prof. Tam]**
Cellulose Nanomaterials: Synthesis, Properties, and Applications
- 4:40 - 5:00 **Damin Kim [Prof. Duhamel]**
Better Understanding the Structure of Glycogen with Pyrene Excimer Fluorescence
- 5:00 **Closing Remarks**

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- 20-001 **Modeling of RAFT Polymerization of MMA in Supercritical Carbon Dioxide using the PC-SAFT Equation of State**
P. Lopez-Dominguez, J.E. Rivera-Pelaez, G. Jaramillo-Soto, J.F. Barragan-Aroche, E. Vivaldo-Lima
Reaction Chemistry & Engineering. 01/20
- 20-002 **Finite Element Implementation of Viscoelastic and Viscoplastic Models based on Multi-Integral Formulation**
H. Sepiani, M. Polak, and A. Penlidis
Engineering Computations. 01/20
- 20-003 **Synergetic Combination of Interfacial Engineering and Shape Changing Modulation for Biomimetic Soft Robotic Devices"**
L. Yu, P. Si, L. Bauman, B. Zhao
Langmuir. 03/19
- 20-004 **Designing Optimal Terpolymers for Enhanced Oil Recovery (Polymer Flooding)**
A. Scott and A. Penlidis
I & ECR 03/20
- 20-005 **Evaluation of Polymeric Materials for Chemical Enhanced Oil Recovery**
A. Scott, L. Romero-Zeron, A. Penlidis
Processes. 03/20
- 20-006 **Chemical Modification of Poly(1-Butene) Resins Through Reactive Processing**
B. Tzoganakis, X. Zhang, M. Zatloukal
Polymer Engineering & Science. 03/20
- 20-007 **Straightforward Synthesis and Evaluation of Polymeric Sensing Materials for Acetone Detection**
A. Scott, N. Majdabadifarahani, K. Stewart, T. Duever, A. Penlidis
Macromolecules Reaction Engineering 04/20
- 20-008 **Reduction of molar mass loss and enhancement of thermal and rheological properties of recycled poly(lactic acid) by using chain extenders obtained from RAFT chemistry**
J.J. Benvenuta_Tapia and E. Vivaldo-Lima
Reactive and Functional Polymers Eng. 05/20
- 20-009 **Biotemplated synthesis of cellulose nanocrystal@PVP-assisted polydopamine@Ag nanoparticle as conductive composites**
L. Chen, P. Si and B. Zhao
Journal of Materials Science: Materials in Electronics. 05/19

- 20-010 **Transition Metal-Free ipso-Arylative Condensation**
G. Sinclair, A. Kukor, K. Imperial, D. Schipper
Macromolecules. 05/20
- 20-011 **Poly methacrylic acid sodium salt (PMANa)/Polyurethane (PU) Latex-Polyelectrolyte Colloid Systems Enabling One-Pot Fabrication of Non-periodic Structured Mechanoresponsive Smart Windows**
JP. Si, L. Yu and B. Zhao
ACS Applied Materials & Interfaces. 05/20
- 20-012 **Modeling of pretreatment and acid/alkaline hydrolyses of lignocellulosic biomasses in twin-screw extruders**
J.C. Morales-Huerta, G. Jaramillo-Soto, O. Manero, E. Barzana, E. Vivaldo-Lima
Industrial and Engineering Chemistry Research. 05/20
- 20-013 **Modeling of reversible deactivation radical polymerization of vinyl monomers promoted by redox initiation using NHPI and xanthone**
P. Lopez-Dominguez, D. A. Clementi-Montes, E. Vivaldo-Lima
Macromolecular Reaction Engineering. 05/20
- 20-014 **The Effect of Like-Charges on the Conformation and Internal Dynamics of Polypeptides Probed by Pyrene Excimer Fluorescence**
R. Casier and J. Duhamel
Macromolecules, 06/20
- 20-015 **Assemblies of Hydrophobically Modified Starch Nanoparticles Probed by Surface Tension and Pyrene Fluorescence**
C. Kim, R. Amos, M. Gauthier, J. Duhamel
ACS Symposium Series Nanoparticles and Molecular Assemblies Ed. Nagarajan, R.06/20
- 20-016 **The Effect of Structure on Polypeptide Blobs: A Model Study Using Poly(L-Lysine)**
R. Casier and J. Duhamel
Langmuir. 06/20
- 20-017 **Viscoelastic tribopairs in dry and lubricated sliding friction**
A. Kim, A. Cholewinski, S. Mitra, B. Zhao
Soft Matter, 06/20
- 20-018 **Active Role of Water in Hydration of Macromolecules with Ionic End Group for Hydrophobic Effect-Caused Assembly**
H. He, Z. Liu, S. Chen, X. He, X. Wang, X. Wang
Macromolecules. 07/20
- 20-019 **Ultrastable monodisperse polymer glass formed by physical vapour deposition**
A. Raegan, J. Yin, Q. Zhou and J. Forrest
Nature Materials 05/20

- 20-020 **Analysis of the Competition between Cyclization and Linear Chain-Growth in Kinetically Controlled A2 + B2 Step-Growth Polymerizations using Modeling Tools**
J.E. Romero-Hernandez, A. Cruz-Rosado, E. Vivaldo-Lima, J. Palacios-Alquisira, M. G. Zolotukhin
Macromolecular Theory and Simulations 07/20
- 20-021 **Recyclable antimicrobial sulphonated poly (ether ether ketone) – copper films: flat vs micro-pillared surfaces**
s. Muralidharan, L. Bauman, W. Anderson and B. Zhao
Materials Today Communications, 07/20
- 20-022 **A Pyrene Excimer Fluorescence (PEF) Study of the Interior of Amylopectin in Dilute Solution**
L. Li, D. Kim, Z. Xiaofang, J. Duhamel
Macromolecules, 07/20
- 20-023 **Metal Coordination Induces Phase Segregation in Amphipolar Arborescent Copolymers with a Core-Shell-Corona Architecture**
J. Dockendorff, A. Mourran, R. Gumerov, I. Potemkin, M. Moller, M. Gauthier
Macromolecules, 08/20
- 20-024 **The Role of Nitroxide Degradation on the Efficiency of the Controller in Nitroxide-Mediated Radical Polymerization (NMP) of Styrene**
R. Cuatepotzo-Díaz, B. López-Méndez, P. López-Domínguez, M. Albores-Velasco, A. Penlidis, and E.Vivaldo-Lima
Industrial & Engineering Chemistry Research, 08/20
- 20-025 **Facile Synthesis of Carboxylated Derivatives of Poly(isobutylene)(IIR) by Thiol-ene “Click” Chemistry**
Polymer Journal, 09/20
- 20-026 **Triple non-covalent dynamic interactions enabled tough and rapid room temperature self-healing elastomer for next generation soft antenna**
JP. Si, F. Jiang, Q. Cheng, G. River, H. Xie, A. Kyaw, and B. Zhao
Journal of Materials Chemistry A, 09/20
- 20-027 **Initiator Feeding Policies in Semi-Batch Free Radical Polymerization: A Monte Carlo Study**
A. Seyedi, M. Najafi, G. Russell, Y. Mohammadi, E. Vivaldo-Lima, A. Penlidis
Process, 10/20
- 20-028 **Antioxidant and antimicrobial material by grafting of L-Arginine onto enzymatic poly(gallic acid)**
M. Hernandez-Valdepena, C. Hernandez-Valencia, P. Labra-Vazquez, C. Wachter, G. Diaz-Ruiz, A. Vazquez, J. Pedraza-Chaverri, K. Shirai, A. Rosas-Aburto, E. Vivaldo-Lima, E. Barzana, R. Rodriguez-Sonoja, M. Gimeno.
Material Science and Engineering C, 10/20

- 20-029 **The Effect of Amino Acid Size on the Internal Dynamics and Conformational Freedom of Polypeptides**
R. Casier and J. Duhamel
Macromolecules. 10/20
- 20-030 **Hierarchical Data Analysis for the Characterization of Polymeric Materials: Linking Measurements and Statistical Methodology**
N. Filipovic, A. Scott, and A. Penlidis
Chem Eng. Educ(CEE). 10/20
- 20-031 **Blob-Based Approach to Estimate the Folding Time of Proteins Supported by Pyrene Excimer Fluorescence Experiments**
R. Casier and J. Duhamel
Macromolecules. 11/20
- 20-032 **Polymer-based Solid Electrolytes: Material Selection, Design and Application**
G. Xi, M. Xiao, S. Wang, D. Han, Y. Li and Y. Meng
Advanced Functional Materials. 11/20
- 20-033 **Interior of Amylopectin and Nanosized Amylopectin Fragments Probed by Viscometry, Dynamic Light Scattering, and Pyrene Excimer Fluorescence**
L. Li and J. Duhamel
Polymers. 11/20
- 20-034 **Water-Based Polyurethanes for Sustainable Advanced Manufacture.**
P. Si and B. Zhao
Canadian Journal of Chemical Engineering. 11/20
- 20-035 **Durable Poly(N-isopropylacrylamide) Grafted PDMS Micropillared Surfaces for Temperature-modulated Wetting**
L. Bauman, Q. Wen, D. Sameoto, C. Yap and B. Zhao
Colloids and Surfaces A: Physicochemical and Engineering Aspects. 11/20
- 20-036 **Wide bandgap polymer donors for high efficiency non-fullerene acceptor based organic solar cells**
K. He, P. Kumar, Y. Yuan, Y. Li
Materials Advances 11/20
- 20-037 **Direct Measure of the Local Concentration of Pyrenyl Groups in Pyrene-Labeled Dendrons Derived from the Rate of Fluorescence Collisional Quenching**
J. Thoma, S. McNelles, A. Adronov, and J. Duhamel
Polymers. 11/20
- 20-038 **A Highly Stable Diketopyrrolopyrrole (DPP) Polymer for Chemiresistive Sensors**
J. Ngai, X. Gao, P. Kumar, J. Polena, and Y. Li
Advanced Electronic Materials. 12/20

