

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

**NEWSLETTER 2023**

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**NEWSLETTER 2023**

**1. NOTE FROM PROFESSOR JEAN DUHAMEL, IPR DIRECTOR**

What a difference one year makes! After three years of remote work, 2023 marked the year when the IPR was finally able to hold in-person meetings. As a result, the IPR had a full year of in-person activities that included the annual IPR Symposium, the Distinguished IPR lecture, and the IPR student presentation. It was certainly most comforting to experience these in-person interactions, which we had been yearning for during the past three years.

Beside the 18 student presenters, the 45th IPR Symposium held on May 3rd, 2023 hosted the presentations by the two IPR Awardees, Rohan Shorey and Azin Adibi both working under the supervision of Prof. Tizazu Mekonnen in Chemical Engineering. Their presentations entitled “Unlocking the Potential of Lignin for Functional and Sustainable Material Solutions” by Rohan Shorey and “Development of Biopolymer Coating with High Barrier Performance Based on Enzymatic Polysaccharide and Natural Rubber for Paper-based Packaging Applications” by Azin Abidi were well attended and generated very interesting questions. As usual, the IPR hosted two keynote speakers. This year, they were Dr. Jason Dockendorf from 3M Canada who spoke on his path “From Graduate School to Industry: Perspectives on Career Path and some Interesting Discoveries and Projects along the way” and Prof. Mario Gauthier who delivered an outstanding review of his career achievements in the field of “Controlled Architecture Polymers: What, Why, and How?”. Although all presenters gave their talk in-person, the IPR Symposium was given in a hybrid format to enable remote attendance, particularly for our colleagues from the industry who were not able to attend in person.

The IPR Distinguished Lecture was delivered on October 25, 2023 by Prof. Timothy Swager from the Massachusetts Institute of Technology (MIT). Prof. Swager delivered an impressive talk entitled “Intrinsically Porous Organic Polymers in Sensing and Catalysis”, which was very well attended and led to an interesting discussion. In particular, Prof. Swager described how rigid structural motives can be introduced in a matrix of conducting polymers to create spaces between the chains to amplify the sensory response of the material. This critical design principle has led to the commercialization of these polymeric materials for explosive detectors.

Graduate student Sanjay Patel from my group gave this year IPR student presentation on the use of “Experimental Techniques to Characterize Macromolecular Conformations”. As a senior graduate student (Sanjay is scheduled to defend his PhD thesis on April 4th, 2024), Sanjay provided an in-depth review of the techniques most commonly used to provide conformational information about macromolecules before introducing the main topic of his graduate work which is the use of pyrene excimer formation as a novel methodology to probe macromolecular conformations.

Beside these on-going activities, the IPR members also continue to distinguish themselves for their contributions to the publication of important and novel achievements in polymer research through their editorial responsibilities. Prof. Penlidis is serving on the editorial board of Polymer-Plastics Techn. and Eng., Macromol. React. Eng., and Processes. Prof. Tam is an associate editor for ACS Sustain. Chem. Eng. Prof. Tzoganakis serves on the editorial board of Adv. Polym. Technol. Prof. Zhao became a member of the Editorial Board of Nanomanufacturing and is a co-guest editor for a special issue in MDPI Polymers entitled “Composite Hydrogels Toward Next Generation Functional Materials and Devices”. Prof. Jean Duhamel is a member of the advisory editorial board of Langmuir, an editorial board member of Polymers and is a guest editor for the special issue in Polymers entitled “Current Directions and Innovations in Fluorescence Techniques for Characterization of Polymers and Polymeric Materials”.

Before closing this editorial, I look forward to seeing you at the next and 46th IPR Symposium. Departing from the current format of the IPR Symposium, this next symposium will span two days. On Wednesday May 1st, 2024, graduate students will present their latest work on their research along with our two keynote speakers, Dr. Steven Teertstra from Arlanxeo and the former IPR Director, Prof. Alexander Penlidis from the University of Waterloo. This first day of presentations will be followed by a second day of more in-depth talks given by the following IPR colleagues: Profs. Michael Tam, Tizazu Mekonnen, Derek Schipper, Yuning Li, Boxin Zhao, Jamie Forrest, and myself. In this second day of the IPR Symposium, these world-renown experts will be providing a far-reaching outlook about their fields of research. This two-day symposium with short, focused presentations given by graduate students on well-defined research projects followed by more far-reaching presentations given by our IPR colleagues on their current research fields promises to be an exciting moment in Polymer Research. Ensure that you do not miss this great event that you can attend in-person or remotely! We certainly look forward to welcoming you next year for this enhanced IPR Symposium.

## 2. ANNUAL IPR SYMPOSIUM

The 46th Annual IPR Symposium will be held May 1<sup>st</sup> and 2<sup>nd</sup>, 2024. A schedule and registration forms will be circulated electronically.

Many thanks to all who participated in the 2023 Symposium. IPR received very positive feedback regarding the topics covered. The 2023 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 2023, the IPR office sent out 28 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.

## 6. RECENTLY GRADUATED STUDENTS

### Y. Li

MASc	ChE	Flynn, S.	Development of Benzodithiophene (BDT)-Based Wide Bandgap Donor-Acceptor (D-A) Polymers Containing Novel Thiophene and Benzene Acceptor Building Blocks for Organic Solar Cells
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### T. Mekonnen

MASc	ChE	Lee, H.	Development of porous materials based on styrene-ethylene-butylene-styrene for oil spill remediation
PhD	ChE	Adibi, A.	Engineered polysaccharide, Alpha-1,3 Glucan, as a Functional Filler of Rubber Composites
PhD	ChE	Shorey, R.	Chemical Tailoring of Lignin for Functional and Sustainable Material Solutions
PhD	ChE	Wang, Y.	Understanding the fundamentals and application of electrically conductive biofilm in dry digestion

### **A Penlidis**

MASc ChE Kim, G. Polymeric Sensors for Detection of off-gases in Agricultural Lagoons

### **M. Tam**

PhD ChE Wang, Y. Development of Sustainable Superhydrophobic Surfaces for Water Manipulation  
PhD ChE Zhou, W. Superwetting surfaces derived from sustainable materials for environmental and energy applications

### **B. Zhao**

PhD ChE Kim, A. Interface dynamics of soft solids with liquids, solids, and gels

## **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 (retired),	Chemistry	Waterloo
Y. Li	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/](http://www.uwaterloo.ca/institute-polymer-research/)

## **8. MEMBER COMPANIES—2022**

Currently, there are **7 member companies**: (refer also Appendix 3)

Afton

Compuplast Canada Inc.

Lanxess Inc.

Mondelez Inc.

Synothomer Inc.

PolyVision, The Netherlands

Princeton Polymer Consultants, USA

## **9. STUDENT AWARDS**

### **J. Duhamel**

Hunter Little

## **X. Feng**

Jinxuan Zhang, WIN Nano Fellowship  
Sharafat Ali, Vanier Canada Graduate Scholarships; WIN Nano Fellowship  
Iris Samputu, IBET Momentum Fellowship

## **Y. Li**

Andrew Stella, MASc, the First Place Prize and the People's Choice Prize in the 2023 GRADflix Showcase: "Robust, wearable sensors for firefighters made using conductive polymers".

## **A. Penlidis**

Mavani, Bhoomi, NSERC PGSD (2nd year)

## **T. Mekonnen**

Rachel Blanchard – Nano Fellowship, Waterloo Institute of Nanotechnology, NSERC - Canada Graduate Scholarships — Master's program  
Rohan Shorey - 2022 Institute for Polymer Research annual award  
Azin Adibi - 2022 Institute for Polymer Research annual award  
E. Vivaldo-Lima

## **B. Zhao**

MASc student  
Aline Braz Ramirez was awarded with Globalink Graduate Fellowship in 2023

## **10. FACULTY AWARDS**

### **E. Vivaldo-Lima**

Outstanding Reviewer 2022, Reaction Chemistry & Engineering, Royal Society of Chemistry, March 2023, <https://www.rsc.org/journals-books-databases/author-and-reviewer-hub/reviewer-information/outstanding-peer-reviewers/2022/reaction-chemistry-engineering/>

## **X. Feng**

Faculty of Engineering Distinguished Performance Award

## **Y. Li**

The article 'Recent progress in developing n-type organic semiconductors for organic field effect transistors' has been selected to be included in the Dedicated Author' anniversary collection, to celebrate 10 years of high quality, impactful and timely research in Journal of Materials Chemistry C.

## **T. Mekonnen**

Tizazu Mekonnen – Canada Research Chair (Tier II) Sustainable Multiphase Polymers

## **A. Penlidis**

I & EC Research journal, Excellence in Review Award (42 selected out of 6,000 reviewers internationally)

## 11. FULL REFEREED JOURNAL PAPERS

### J. Duhamel

Kim, D.; Duhamel, J. Interior of Glycogen Probed by Pyrene Excimer Fluorescence. *Carbohydr. Polym.* 2023, 299, 120205.

Casier, R.; Duhamel, J. Synergetic Effects of Alanine and Glycine in Blob-Based Methods for Predicting Protein Folding Times. *J. Phys. Chem. B* 2023, 127, 1325-1337.

Galan, A.; Lulic, K.; Wang, J.; Wicher, B.; Huc, I.; Duhamel, J.; Maurizot, V. Coaxial Assembly of Helical Aromatic Foldamers by Metal Coordination. *Chem. Commun.* 2023, 59, 5253-5256.

Patel, S.; Duhamel, J. Macromolecular Conformation of Low Generation PAMAM Dendrimers Probed by Pyrene Excimer Formation. *Macromolecules* 2023, 56, 4012-4021.

Little, H.; Thoma, J.; Yeung, R.; D'Sa, A.; Duhamel, J. Persistence Length and Encounter Frequency Determination from Fluorescence Studies of Pyrene-Labeled Poly(oligo(ethylene glycol) methyl ether methacrylate)s. *Macromolecules* 2023, 56, 3562-3573.

Frasca, F.; Duhamel, J. Characterization of Polyisobutylene Succinic Anhydride (PIBSA) and its PIBSI Products from the Reaction of PIBSA with Hexamethylene Diamine. *Polymers* 2023, 15, 2350.

Liu, D.; Duhamel, J.; Gauthier, M. Synthesis and Characterization of Furan-Based Non-Ionic Surfactants (fbnios). *Langmuir* 2023, 39, 8974-8983.

Little, H.; Patel, S.; Duhamel, J. Probing the Inner Local Density of Complex Macromolecules by Pyrene Excimer Formation. *Phys. Chem. Chem. Phys.* 2023, 25, 26515-26525.

Patel, S.; McNelles, S.; Adronov, A.; Duhamel, J. Intra-Macromolecular Conformational Changes in Low Generation PAMAM Dendrimers Probed by Pyrene Excimer Formation. *J. Phys. Chem. B* 2023, 127, 8040-8048.

Casier, R.; Duhamel, J. Appraisal of Blob-Based Approaches in the Prediction of Protein Folding Times. Accepted in *J. Phys. Chem. B* 2023.

Thoma, J.; Little, H.; Duhamel, J.; Zhang, L.; Leung, T. Persistence Length of PEGMA Bottle Brushes Determined by Pyrene Excimer Fluorescence. *Polymers* 2023, 15, 3958.

### X. Feng

K. Jin, K. Hou, J. Wang, S. Zhai, Z. Fan, Y. Zhao, K. Xie, Z. Cai, X. Feng (2023), "Composite membranes with multifunctionalities for processing textile wastewater: Simultaneous oil/water separation and dye adsorption/degradation," *Separation and Purification Technology*, 320, 124176.

R. Goswami, M. Gogoi, A. Borah, H. Sarmah, A.R. Borah, X. Feng, S. Hazarika (2024), "Quantum dot-  $\beta$ -Cyclodextrin nanofiller decorated thin film nanocomposite membrane for removal of cationic and anionic dyes from aqueous solution," *Materials Today Chemistry*, 35, 101871.

Z. Li, K. Hu, X. Feng (2023), "Hollow fiber membranes comprising of polyvinylamine/polydopamine active layers and a polyvinylidene fluoride substrate for pervaporative concentration of KAc solutions," *Separation and Purification Technology*, 313, 123466

- M. Wang, Y. Chen, Y. Zhang, K. Zhao, X. Feng (2023), "Selective removal of Cr(VI) by tannic acid and polyethyleneimine modified zero-valent iron particles with air stability," *Journal of Hazardous Materials*, 458, 132018.
- J. Liang, S. Lin, X. Feng, Q. Pan (2023), "Fabrication and characterization of superhydrophobic melamine foam for effective separation of immiscible and emulsified oil/water mixtures," *Journal of Porous Materials*, 30, 1937–1951.
- Y. Sun, H. Liu, Y. Qin, X. Feng, J. Chen, Q. Huang, C. Xiao (2023), "Controllable construction of ultrathin graphene quantum dots/polyamide nanofilms via electrospray interfacial polymerization," *Separation and Purification Technology*, 317, 123831.
- X. Wang, W.Z. Zhang, H. Li, F. Song, Z. Wang, X. Feng (2023), "Preparation and properties of PVDF-CTFE/g-C<sub>3</sub>N<sub>4</sub> composite microporous membranes," *Membrane Science and Technology*, 43, 99-108.
- M. Wang, Y. Chen, W. Su, K. Zhao, X. Feng (2023), "Sodium alginate encapsulated nano zero valent iron loaded in aminated magnesium hydroxide for effective removal of chromium," *Separation and Purification Technology*, 308, 122901.
- Z. Li, K. Hu, X. Feng (2023), "Co-depositing polyvinylamine and dopamine to enhance membrane performance for concentration of KAc solutions via sweeping air pervaporation," *Journal of Membrane Science*, 656, 120664.

### **M. Gauthier**

- S. Cai, Z. Cheng, L. D. W. Djouonkep, L. Wang, H. Wang, M. Gauthier.  
Synthesis and Properties of Bio-based Copolyesters Based on p-Hydroxyphenylpropionic Acid.  
*J. Polym. Environ.* 2023, 31(5), 2138-2147; <https://doi.org/10.1007/s10924-022-02732-7>.
- W. M. K. Siegu, L. D. W. Djouonkep, N. B. S. Selabi, E. M. Bonku, Z. Cheng, M. Gauthier.  
Synergistic Effect and Structure-Property of Bio-based 1,6-Hexanediol on Thermal, Mechanical and Degradation Properties of Biopolymers.  
*J. Polym. Environ.* 2023, 31(3), 1144-1159; <https://doi.org/10.1007/s10924-022-02666-0>.
- L. Zhang, Z. Cheng, S. Cai, L. Wang, H. Wang, P. Pan, Y. Yang, J. Li, J. Qin, M. Gauthier.  
Green Preparation of Aminopyrazine and Its Application in the Synthesis of Pharmaceutical Intermediates.  
*Faming Zhuanli Shenqing* 2023, CN 115557905 A 20230103 (Chinese patent application).
- W. M. K. Siegu, L. D. W. Djouonkep, N. B. S. Selabi, E. M. Bonku, Z. Cheng, M. Gauthier.  
Synergistic Effect and Structure-Property of Bio-based 1,6-Hexanediol on Thermal, Mechanical and Degradation Properties of Biopolymers.  
*J. Polym. Environ.* 2023, 31(3), 1144-1159; <https://doi.org/10.1007/s10924-022-02666-0>.
- D. Parisi, D. Truzzolillo, A. H. Slim, P. Dieudonne-George, S. Narayanan, J. C. Conrad, V. D. Deepak, M. Gauthier, D. Vlassopoulos.  
Gelation and Re-entrance in Mixtures of Soft Colloids and Linear Polymers of Equal Size.  
*Macromolecules* 2023, 56(5), 1818-1827. <https://doi.org/10.1021/acs.macromol.2c02491>.
- Z. Cheng, J. Cheng, J. Zhou, L. Wang, H. Wang, S. Cai, X. Sun, R. Jia, B. Yuan, Y. Yang, M. Gauthier.  
Preparation of Biphenyldicarboxylic Acid-based Polyester for Polyester Nanosilver Conductive Film.  
*Faming Zhuanli Shenqing* 2023, CN 115677994 A 20230203 (Chinese patent application).
- N. Dasgupta, D. Sun, M. Gorbet, M. Gauthier.  
Chitosan Grafted with Thermoresponsive Poly(di(ethylene glycol) Methyl Ether Methacrylate) for Cell Culture

Applications.

Polymers 2023, 15(6), 1515; <https://doi.org/10.3390/polym15061515>.

M. Alsehli, M. Gauthier.

Unimolecular Micelles from Randomly Grafted Arborescent Copolymers with Different Core Branching Densities: Encapsulation of Doxorubicin and In Vitro Release Study.

Materials 2023, 16(6), 2461; <https://doi.org/10.3390/ma16062461>.

L. Yi, X. Wu, S. Ouyang, L. Guo, J. Chen, M. Gauthier, W.-Y. Li.

Theoretical Insight and Experimental Exploration of Indole Extraction from Wash Oil with Deep Eutectic Solvents.

Arabian J. Chem. 2023, 16(12), 105341; <https://doi.org/10.1016/j.arabjc.2023.105341>.

H. Wang, Z. Cheng, L.D.W. Djouonkep, C. Lan, L. Wang, S. Cai, L. Ding, M. Gauthier.

Bio-based Copolyesters from p-Hydroxybenzaldehyde: Synthesis, Characterization and Thermo-Mechanical Properties.

JOM 2023, 75(12), 5300-5309; <https://doi.org/10.1007/s11837-023-06047-3>.

B.M. Bakadia, A.A. Qaed Ahmed, L. Lamboni, Z. Shi, B. Mutu Mukole, R. Zheng, M. Pierre Mbang, B. Zhang, M. Gauthier, G. Yang.

Engineering Homologous Platelet-rich Plasma, Platelet-rich Plasma-derived Exosomes, and Mesenchymal Stem Cell-derived Exosomes-based Dual-crosslinked Hydrogels as Bioactive Diabetic Wound Dressings.

Bioactive Mater. 2023, 28, 74-94; <https://doi.org/10.1016/j.bioactmat.2023.05.002>.

L. Wang, Z. Cheng, L.D.W. Djouonkep, C. Lan, S. Cai, H. Wang, X. Sun, M. Gauthier.

Synthesis and Properties of Biodegradable Polyesters Based on Orcinol.

J. Polym. Environ. 2023, 31(10), 4314-4325; <https://doi.org/10.1007/s10924-023-02887-x>.

H. Wang, Z. Cheng, L.D.W. Djouonkep, L. Wang, S. Cai, M. Gauthier.

Synthesis and Properties of Biodegradable Aliphatic-aromatic Polyesters Derived from 4-Hydroxybenzaldehyde.

J. App. Polym. Sci. 2023, 140(29), e54063; <https://doi.org/10.1002/app.54063>.

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Synthesis and Characterization of Furan-Based Non-Ionic Surfactants (fbnios).

Langmuir 2023, 39(26), 8974-8983; <https://doi.org/10.1021/acs.langmuir.3c00344>.

X. Sun, Z. Cheng, L.D.W. Djouonkep, C. Lan, R. Jia, S. Zeng, J. Cheng, R. Tang, Y. Li, B. Yuan, M. Gauthier.

Synthesis and Characterization of Novel Hydrolytically Degradable Polyesters.

J. Wuhan Univ. Technol., Mater. Sci. Ed. 2023, 38(2), 467-473;

<https://doi.org/10.1007/s11595-023-2720-6>.

M. Alsehli, M. Gauthier.

Influence of the Core Branching Density on Drug Release from Arborescent Poly( $\gamma$ -benzyl L-glutamate) End-Grafted with Poly(ethylene oxide).

Int. J. Transl. Med. 2023, 3, 496-515; <https://doi.org/10.3390/ijtm3040035>.

## **Y. Li**

Huang, Z.; Gao, X.; Wang, Y.; Li, Y. Mitigating First Charge Overpotential of Li<sub>2</sub>S-Based Lithium-Sulfur Batteries by Leveraging PVDF Reaction with the LiOH/Li<sub>2</sub>O Layer. Journal of Power Sources 2023, 582, 233530.

<https://doi.org/10.1016/j.jpowsour.2023.233530>.

Shabzendedar, S.; Modarresi-Alam, A. R.; Paymozd, F.; Yarmohamadi-Vasel, M.; Kaedi, F.; Li, Y. Solar Cells

Containing Two Novel Superparamagnetic Nanocomposites of Fe<sub>3</sub>O<sub>4</sub>-TiO<sub>2</sub>-Poly(m-Aminobenzenesulfonic Acid). *Synthetic Metals* 2023, 295, 117335. <https://doi.org/10.1016/j.synthmet.2023.117335>.

Sun, B.; Chen, Y.; Zhou, G.; Zhou, Y.; Guo, T.; Zhu, S.; Mao, S.; Zhao, Y.; Shao, J.; Li, Y. A Flexible Corn Starch-Based Biomaterial Device Integrated with Capacitive-Coupled Memristive Memory, Mechanical Stress Sensing, Synapse, and Logic Operation Functions. *Adv Elect Materials* 2023, 2201017. <https://doi.org/10.1002/aelm.202201017>.

## **T. Mekonnen**

Pieters, K., Mekonnen, T.H.\* Stable aqueous dispersions of poly (3-hydroxybutyrate-co-3-hydroxyvalerate)(PHBV) polymer for barrier paper coating. *Progress in Organic Coatings*. 2024, 187: 108101.

Chen, G., Vahidifar, A., Yu, S., T. Mekonnen, T.H.\*. Sulfur Free Crosslinking of EPDM Composites via Silane Grafting and Silica Incorporation. *Macromolecular Rapid Communications*, 2023, 2300563.

Nasseri, R., Bouzari, N., Huang, J., Golzar, H., Jankhani, S., Tang, X., Mekonnen, T.H., Aghakhani, A., Shahsavan, H\*. Programmable Nanocomposites of Cellulose Nanocrystals and Zwitterionic Hydrogels for Soft Robotics. *Nature Communications*. 2023, 14(6108) (High impact factor = 16.6)

Jubenville, D. Sharifi, J. Fayazfar, H. Mekonnen, T.H.\* Hemp hurd filled PLA- PBAT blend biocomposites compatible with additive manufacturing processes: fabrication, rheology, and material property investigations. *Polymer Composites*. 2023, 44(12): 8946-8961.

Chen, G. Adibi, A. Jubenville, D., Mekonnen, T.H.\* Crosslinking networks in epoxidized natural rubber/hemp hurd bio-composites for the enhancement of thermal, mechanical, and water repellence properties. *Polymer Composites*. 2023, 44(11): 8168-8185.

Chang, B. Trinh, B.M. Tadele, D. Bandara, N. Mekonnen, T.H.\* Natural Antioxidant and Antimicrobial Agents and Processing Technologies for the Design of Active Food Packaging Polymers. *Polymer Reviews*. 2023, 64: 1-53.

Jubenville, D. Mekonnen, T.H.\* (2023). Recycled Post-Consumer HDPE as a Matrix for Hemp Hurd Bio-Composites for Commercial Scale-Up Operations. *Journal of Polymers and the Environment*. 2023, <https://doi.org/10.1007/s10924-023-03003-9>.

Trinh, B. Owen, P. Vanderheide, A. Gupta, A. Mekonnen, T.H.\* Recyclable and Self-healing Natural Rubber Vitrimers from Anhydride-epoxy Exchangeable Covalent Bonds. *ACS Applied Polymer Materials*. 2023, 5(11), 8890–8906.

Ataiean, P., Trinh, B., Mekonnen, T.H.\* Acceleration of bioplastic biodegradation via the encapsulation of pro-oxidants. *Journal of Applied Polymer Science*, 2023, e54970.

Tadele, D. Trinh, B. Mekonnen, T.H.\* PBAT/corn zein ester blends: Rheology, morphology, and physicochemical properties. *Polymer*. 2023, 283: 126258.

Blanchard, R. Mekonnen, T.H.\*. Utilization of epoxy thermoset waste to produce activated carbon for the remediation of nano-plastic contaminated wastewater. *Separation and Purification Technology*. 2023, 326: 124755.

Tsegaye, G. Kiflie, Z. \* Mekonnen, T.H. Jida, M. Synthesis and characterization of coffee husk extract (CHE) capped ZnO Nanoparticles and their antimicrobial activity. *Biomass Conversion and Biorefinery*. 2023, 13(16): 14300.

Lee, H. Trinh, B.M. Crawford, E.A. Mekonnen, T.H.\* Thermoplastic elastomer melt-blown fiber mats for oil spill remediation: Fabrication, oil uptake, and gel formation studies. *Separation and Purification Technology*. 2023, 326:

124761.

Eslami, H. Mekonnen, T.H.\* Flexible and green multilayer paper coating for barrier enhancement of paper packaging. *Sustainable Materials and Technologies*. 2023, 37: e00694.

Nasrollahzadeh, F., Skoy, K., Spotti, J., Mekonnen, T.H., Chen, M., Martinez, M.\* Dispersion of a low concentration of fibrillated protein fillers into plant protein melts imparts elasticity and diminishes the tenderness gap for plant-based foods. *Food Hydrocolloids*. 2023, 108985.

Adibi, A., Simon, L., Lenges, C., Mekonnen, T.H.\* Sustainable Natural Rubber Composites: Masterbatch development of epoxidized natural rubber grafted to designed enzymatic polysaccharides. *RSC Materials Chemistry Frontiers*. 2023, 7, 341-356. (Cover page article)

Lee, H., Gupta, A., Mekonnen, T.H.\* Fabrication of Triblock Elastomer Foams for Oil Absorption Applications: Effects of Crosslinking, Composition, and Rheology Factors. *ACS Applied Polymer Materials*. 2023.  
<https://doi.org/10.1021/acsapm.3c00567>.

Trinh, B.M. Chang, B., Mekonnen, T.H.\* The barrier properties of sustainable multiphase and multicomponent packaging materials: A review. *Progress in Materials Science*, 2023, 133, 101071. (41 pages). (Very high impact factor IF 37).

Chen, G., Gupta, A., Mekonnen, T.H.\* Effects of wood fiber loading, silane modification and crosslinking on the thermomechanical properties and thermal conductivity of EPDM biocomposite foams. *Industrial Crops and Products*. 2023, 200. 116911.

Movahed, D.A., Jonoobi, M.\*, Ashori, A.\*, Mekonnen, T.H. Life cycle assessment and mechanical properties of nanocomposites based on cellulose nanocrystals. *Polymer Engineering and Science*. 2023, 1, 1-9.

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### **A Penlidis**

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### **M. Tam**

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## **E. Vivaldo-Lima**

Alfredo Cruz-Rosado, Juan Enrique Romero-Hernández, Marlene Rios-López, Salvador López-Morales, Gerardo Cedillo, Lucero Mayra Rios-Ruiz, Enoc Cetina-Mancilla, Joaquín Palacios-Alquisira, Mikhail G. Zolotukhin, and Eduardo Vivaldo-Lima\*, “Nonstoichiometric effect in the superacid-catalyzed polyhydroxyalkylation of biphenyl and 1-propyl isatin”, *High Perform. Polym.*, 35(9), 883-891, 2023; <https://doi.org/10.1177/09540083231174371>.

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## **B. Zhao**

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Pengxiang Si, Jihua Zou, Yun Wu, Zhu Long, Manyou Sun, Aleksander Cholewinski, Guozhi Huang, Boxin Zhao, Dan Zhang “Rippling colloidal polyelectrolyte complex for customized fingerprints with high tactile perception”, *Small* [IF = 15.153], 19(37), 2303304, 2023

Yuan Wei, Chunyu Wang, Yingying He, Gang Chen, and Boxin Zhao, “Asymmetric “Janus” Biogel for Human-Machine Interfaces”, *Advanced Functional Materials* [IF=19.92], 33, 2214366, 2023

Lukas Bauman, Boxin Zhao\*, "Multi-thermo Responsive Double Network Composite Hydrogel for 3D Printing Medical Hydrogel Mask", Journal of Colloids and Interfacial Science [IF=9.965], 638, 882-892, 2023

### **13. CONFERENCE PRESENTATIONS/INVITED SEMINARS**

#### **J. Duhamel**

Characterizing the Conformation of Complex Macromolecules by Pyrene Excimer Formation in Lieu of Scattering Techniques. Sanjay Patel and Jean Duhamel, International Materials Research Congress, Cancun, Mexico, August 13 – 18, 2023.

#### **X. Feng**

X. Cao, X. Feng, "Pervaporation and perstraction for removal of high boiling organic contaminants from water: A unified approach to mass transfer," presented at the 13th International Congress on Membranes and Membrane Processes (ICOM 2023), Chiba, Japan July 9 - 14, 2023.

G. Francisco, K. Hu, X Feng, "A non-thermal process to extract aroma compounds from coffee using membranes," presented at the 13th International Congress on Membranes and Membrane Processes (ICOM 2023), Chiba, Japan July 9 - 14, 2023

#### **Y. Li**

Li, Y., keynote lecture, Polymer Donors with Novel Thiophene-Based Electron Acceptor Building Blocks for Organic Solar Cells, International Conference on Energy, Materials, and Photonics, 2023 (MP23), Singapore, August 17-20, 2023.

Li, Y., invited lecture, Polymer semiconductors for organic field effect transistors, Sustainable strategies for Organic Electronics summer school, Université D'Angers, Angers, France, June 24 – July 1, 2023.

Li, Y., keynote lecture, Polymer semiconductor design for high-efficiency and low-cost polymer solar cells, the Canadian Chemistry Conference and Exhibition (CSC 2023), Vancouver, June 05, 2023.

#### **T. Mekonnen**

Mekonnen, T. Reactive extrusion as a solvent free reactor for polymer modification. ACCE inaugural conference, July 2023, Seoul, South Korea (Invited speaker)

Tesfaye, D., Mekonnen, T., Corn zein protein for bioactive nanoencapsulation. IBET Conference, Oct 24, 2022. Edmonton, AB, Canada

#### **M. Gauthier**

M. Gauthier POLY-CHAR Auckland 2023, January 2023, Auckland, New Zealand.  
"Arborescent Polypeptides Based on Poly( $\gamma$ -benzyl L-glutamate) for Drug Delivery Applications"

M. Gauthier International Materials Research Conference, August 2023, Cancún, México.  
"Castor Bean Oil–Isocyanate Prepolymers as Cross-linkers for Starch"

## **D. Schipper**

What Does an Organic Chemist do? LHCS Elementary School - Invited Lecture, Kitchener, Canada

(High Performance Polymers for Construction Applications. HighTechXL Invited Lecture, Eindhoven, Netherlands  
Effect of Thiazole N-Oxides on Exciton Binding in Conjugated Organic Materials. 2023 Canadian Chemistry  
Conference and Exhibition, Vancouver, Canada

Incorporation of Thiazole N-Oxides into Conjugated Organic Materials. 2023 Canadian Chemistry Conference and  
Exhibition, Vancouver, Canada (2023). Reaction Development for the Synthesis of Conjugated Organic Materials.  
EuChemS Division of Organic Chemistry 14th Young Investigator Workshop, Leuven, Belgium

Reaction Development for the Synthesis of Conjugated Organic Materials. CSC Young Investigator Symposium,  
Vancouver, Canada

## **M. Tam**

Invited plenary talk, Colombian Chemistry Conference, 4-6 October 2023, Bogota, Colombia

Invited plenary talk, Nanocellulose summit, 9-11 August 2023, Sao Carlos, Brazil.

Invited talk, Waterloo Institute for Nanotechnology, University of Waterloo, Canada, 21 June 2023

Invited talk, Institute of Materials Research & Engineering, Singapore 10 April 2023

Invited talk, Ho Chi Minh University of Technology, Ho Chi Minh City, Vietnam, 18 April 2023

Invited talk, Nanyang Technological University, Singapore, 1 March 2023

Invited plenary talk, 2nd International Symposium on Advanced Functional Materials, Kuala Lumpur, Malaysia, 16-  
17 February 2023

## **A. Penlidis**

Penlidis, A., H. Tobita, S. Zhu and J.B.P. Soares (2023). The contributions of AE Hamielec to Polymer Reaction  
Engineering (PRE). 73rd CSChE conference, Calgary, AB, Canada (Oct 29-Nov1, 2023); AE Hamielec memorial  
sessions, Mon, Oct 30, 2023, PRE session (8:10-8:30 am). Invited presentation.

Mavani, B. and A. Penlidis (2023). Polymer synthesis to novel applications to polymeric sensors. 73rd CSChE  
conference, Calgary, AB, Canada (Oct 29-Nov1, 2023); AE Hamielec memorial sessions, Mon, Oct 30, 2023, PRE  
session (9:10-9:30 am). Invited presentation.

Scott, A.J., L. Romero-Zeron and A. Penlidis (2023). Can polymer flooding in EOR benefit from a sequential polymer  
design? 73rd CSChE conference, Calgary, AB, Canada (Oct 29-Nov1, 2023); AE Hamielec memorial sessions,  
Tues, Oct 31, 2023 PRE session (am). Invited presentation.

Ou, M., Y.S. Shama, B. Mavani, M. Arabi, R. Saritas, R. Abdelrahman, S. Rahmanian, A. Elhady, R. Mansour, A.  
Penlidis and E. Abdel-Rahman (2023). Static and dynamic MEMS inertial gas sensors. Refereed Conference  
Proceedings, # 0493 (4 pgs), Session 3.09 Flexible and Wearable Devices and Systems, Transducers 2023, 22nd Intern.  
Conf. on Solid-State Sensors, Actuators and Microsystems, Kyoto, Japan, June 25-29, 2023

## **E. Vivaldo-Lima**

“NOVEL METHODOLOGY OF ENGINEERING AROMATIC POLYMERS WITH RIGID KINK-STRUCTURED BACKBONES” (oral), Enoc Cetina-Mancilla (speaker), Germán Antonio Reyes García, María Ortencia González Díaz, Manuel Aguilar Vega, Eduardo Vivaldo-Lima, D10. Polymers and Nanopolymers: Synthesis, Characterization, Properties and Applications Symposium at the 31st International Materials Research Congress held in Cancun, Mexico from August 13th to 18th, 2023.

“Development of Technologies and Mathematical Models for Biorefining Processes Based on Lignocellulosic Biomasses” (invited oral presentation to E. Vivaldo), Eduardo Vivaldo-Lima (Primary Presenter), Juan Carlos Morales-Huerta, Garcés-Sandoval Fernando Iván, Oscar Hernández-Meléndez, Jorge Alcaraz-Cienfuegos, María de los Ángeles Valdivia-López, Alberto Rosas-Aburto, Carmina Montiel, Alfredo Martínez, Martín Guillermo Hernández-Luna, and Eduardo Bárzana, Symposium in Honour of Prof. Archie E. Hamielec of McMaster University, “73rd Annual Meeting of the Canadian Society for Chemical Engineering (CSCHE 2023 Conference)”, Calgary, Alberta, Canada, October 29, 2023 to November 1, 2023.

“Heavy metal removal using cellulose obtained from lignocellulosic waste, modified via ATRP insertion” (poster), Miriam García Vargas\*, Alberto Rosas-Aburto, Martín G. Hernández-Luna and Eduardo Vivaldo-Lima, 18th Pacific Polymer Conference (PPC 18), December 3-7, 2023, Puerto Vallarta, México.

## **B. Zhao**

Lu Yin, Aleksander Cholewinski, Boxin Zhao, Underwater adhesives for bonding mussel shells in aquaculture, 2023 Canadian Chemical Engineering Conference, Calgary, Oct 29-Nov 1, 2023

Aleksander Cholewinski, William Zhang, Lukas Bauman, Misa Hayashida, Boxin Zhao, Investigating microplastic flow behaviour in aqueous systems, 2023 Canadian Chemical Engineering Conference, Calgary, Oct 29-Nov 1, 2023

Boxin Zhao, “Soft Matter and Interfacial Engineering for Advanced Sustainable Manufacturing” College of Chemistry, Chemical Engineering and Material Science, Soochow University, Dec 1, 2023

Boxin Zhao, “Soft Matter Engineering and Bionanomaterials for Advanced Sustainable Manufacturing” The 7th Canadian Symposium on Teaching and Research Excellence (CanSTARE 7), Waterloo, ON October 14, 2023

Boxin Zhao, ‘Surface Science and Polymer Nanotechnology for Sustainable Advanced Manufacture – Biomimetic soft robotics and wearables’, Department of Chemical and Materials Engineering, University of Alberta, Feb 7, 2023

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

### **X. Feng**

X. Feng, K. Vasarais, J. Hughes, “Processes for fractionating a gaseous material with a facilitated transport membrane,” US Patent Pub No. US20230219869, July 13, 2023.

### **Y. Li**

J Lu, A Dadvand, M Bortolus, A Salima, Y Tao, Y Li, J Quinn, US Patent 11,545,633, “3, 7-bis (2-oxoindolin-3-ylidene) benzo [1, 2-b: 4, 5-b'] difuran-2, 6-dione dicyanide-based materials and uses thereof in organic electronic devices.”

## **A. Penlidis**

Vivaldo-Lima, E., and A. Penlidis (2023). Polymerizations in Supercritical Carbon Dioxide, Chapter in Encyclopedia of Polymer Science and Technology (EPST), 37 pgs (chapter ms length: 45 pgs), Herman F Mark (ed.), Wiley; accepted on May 11, 2023; appeared online on Dec 1, 2023; doi: 10.1002/0471440264.pst086.pub2

Soares, J.B.P., A. Penlidis, H. Tobita and S. Zhu (2023). Archie E. Hamielec Memorial Issue Guest Editorial. Editorial Note, Can. J. Chem. Eng. (CJChE), 101 (9), 4800-4803; special issue in memory of AE Hamielec; accepted April 26, 2023; online May 19, 2023; doi: 10.1002/cjce.24954; editorial refereed note; open access.

Abdel-Rahman, E., R. Mansour and A. Penlidis (2021). Wearable Chemical Hazard Sensors. Technical proprietary report, IDEAS program, DND, Government of Canada. Nov 14, 2021; 240 pages.

## **M. Tam**

Nano-Dispersion Consisting of Cellulose Nanocrystal as Pesticide/Fungicide Carriers for Agriculture and Aquaculture, Tam KC, Tang C.X.; Tang, J.; Kim D.S.; Haji, F.; Cao G., Patent Application #63/475,168, August 8, 2023.

## **C. Tzoganakis**

C. T.Q. Mai and C. Tzoganakis (2023). "Polyolefin-based TPEs: Reactive Processing", Chapter 8 in Advances In Thermoplastic Elastomers: Materials, Challenges And Opportunities N.K. Singha and S.C. Jana (eds), Elsevier Inc. ISBN: 9780323917582

C. Tzoganakis and M. Tzoganakis (2023). "Thermo-mechanical Devulcanization of Waste Rubber through Supercritical CO<sub>2</sub>-assisted Reactive Extrusion", Chapter 6 in Waste Rubber Recycling Routes, N. Ait Hoccine and L. Asaro (eds), pp.193-220, Central West Publishing.

## **E. Vivaldo-Lima**

Eduardo Vivaldo-Lima and Alexander Penlidis, "Polymerizations in supercritical carbon dioxide", in: Encyclopedia of Polymer Science and Technology, Herman F. Mark, Editor, John Wiley & Sons, pp. 1-48, 29 November 2023, DOI: 10.1002/0471440264.pst086.pub2.

Mexican patent MX/a/2018/010702, "PROCESO DE PRODUCCIÓN DE ÁCIDO LIGNOSULFÓNICO Y LIGNOSULFONATOS" (Lignosulfonic acid and lignosulfonates production process), Martín G. Hernández-Luna, Eduardo Vivaldo-Lima, Jorge Alcaraz-Cienfuegos, María de los Ángeles Valdivia-López, Alexis Mercadal-Ramírez, Date applied: 5/September/2018; Date granted: 13/04/2023; Patent number (título de patente): 402025.

## **B. Zhao**

Boxin Zhao, Lu Yin, Aleksander Cholewinski, "The composition and application of solvent-free urethane-based prepolymer as adhesive, coating. and sealing materials" US Provisional application # 63/628,872, Sept 7 2023

## 15. OTHER HIGHLIGHTS FOR THE YEAR 2021

### Jean Duhamel

Jean Duhamel serves on the advisory editorial board of Langmuir. He also served as guest editor for the special issue entitled “Current Directions and Innovations in Fluorescence Techniques for Characterization of Polymers and Polymeric Materials” in Polymers.

### Michael Tam

Deputy Editor, ACS Sustainable Resource Management  
Interviewed by BNN Blomberg, CBC Radio and CTV on Water harvesting using superhydrophobic surface

### Vivaldo-Lima

Prof. Vivaldo-Lima continued his participation as member of FQ-UNAM’s Editorial Committee, ongoing since June 2022.

Prof. Vivaldo-Lima continued his membership in the UK Research and Innovation International Development Peer Review College (UK, 2018 to present).

Prof. Vivaldo-Lima concluded his participation as member of the Professors Evaluation Committee (Comisión Dictaminadora) of the area of Chemical Engineering of FES-Zaragoza UNAM, 2018 to April 2023.

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

Prof. Vivaldo-Lima became a member (by peer election) of FQ-UNAM’s Honorable Technical Council (HCT) (Maximum technical authority at FQ-UNAM), representing the Department of Chemical Engineering. The appointment goes from August 2023 to July 2027.

### A. Penlidis

2023, Journal reviewer, 9 manuscripts

2023, Consultant, 3 companies (USA, Europe); specific names available upon request

2023, Editorial Board Member, Polymer-Plastics Techn. and Eng.

2023, Editorial Board Member, Macromol. React. Eng.

2023, Editorial Board Member, Processes

2023, International/national academic collaborations (regular basis with co-authored articles): UNAM (Mexico), and, more locally, University of Ottawa, UNB, and Ryerson Polytechnic Univ.

2023, Membership in Professional Societies, CIC, CSChE, MSED; Association of Professional Engineers (Europe/Greece); Canadian Academy of Engineering (CAE)

2023, I2I NSERC proposal evaluator for Canadian university

2023, Reviewer of new edition (5th) of classical book by van Krevelen, Estimation of Polymer Properties, Elsevier

2023, Co-organizer of two full days (4 half-day sessions), CSChE Conference, Calgary, AB, Hamielec memorial Sessions; also, chaired one half-day session (Oct 31, 2023)

**B. Zhao**

Board of Directors, Waterloo Institute for Nanotechnology (2022 -2025)

Co-guest editor for the MDPI Polymer, Special Issue: “Composite Hydrogels towards next-generation functional materials and devices”, 2022 –2024

Member of the Editorial Board, MDPI Nanomanufacturing (2021-2023)

**INSTITUTE FOR POLYMER RESEARCH**  
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**Faculty Hall**  
**University of Waterloo, Waterloo, Ontario**  
**Wednesday, May 3, 2023**

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8:45 a.m.	<b>Open Symposium Portal</b>
8:50	<b>Welcome and Opening Remarks</b>
9:00 - 9:20	<b>Rohan Shorey, Chemical Engineering, Waterloo</b> Unlocking the Potential of Lignin for Functional and Sustainable Material Solutions <b>(Winner of 2022 IPR Award for Academic Excellence in Polymer Science/Engineering)</b>
9:20 - 10:20	Industry Speaker: <b>Dr. Jason Dockendorff, 3M.</b>  From Graduate School to Industry: Perspectives on Career Path and Some Interesting Discoveries and Projects Along the Way
10:20 – 10:45	<b><u>5-Min. Mini Presentations</u></b> 1) <b>Zhe Huang</b> Dual Effects of PVDF as a Binder Material on the Abnormal Voltage Behavior in the Initial Charge of Li <sub>2</sub> S-based Li-S Battery 2) <b>Xiguang Gao</b> Coordination Polymers for Lithium-ion Batteries 3) <b>Shahzad Ghodrati</b> Polymeric Sensing Materials for Energy Storage Devices 4) <b>Naixin Zhao</b> DOT-based Conductive Polymer via Direct Arylation 5) <b>Andrew Stella</b> Tailoring Novel Conductive Polymers for Flexible Toxic Gas Sensors
10:45 – 11:15	<b>Coffee</b>
11:15 – 11:35	<b>Bhoomi Mavani</b> Could Polymeric Materials Be Good Gas Detectors?
11:35-12:00	<b><u>5-Min. Mini Presentations</u></b> 6) <b>Youchao Teng</b> Biomass Hydrogels for Human Health Monitoring 7) <b>Kyle Pieters</b> Stabilization of Biodegradable Polymer Dispersions in Aqueous Medium 8) <b>Rachel Blanchard</b>

Conversion of PET Bottle Waste to Activated Carbon for Dye Contaminated Wastewater Treatment

**9) Zahra Parsa**

Utilizing Advanced Oxidation Process (AOP) for the Degradation of Water-Soluble Polymers

**10) Dion Grobe**

Thiazole N-oxide Conjugated Polymers for Low Exciton Binding Organic Electronics

12:00 - 1:00

**Lunch E7 2357-2317**

1:00 - 2:00

**Academic presenter: Dr. Mario Gauthier Emeritus Member of the IPR**

Controlled Architecture Polymers: What, Why and How?

2:00 – 2:20

**Hunter Little**

Persistence Length of Poly(oligo(ethylene glycol) methyl ether methacrylate)s Determined by Pyrene Excimer Formation

2:20 – 2:40

**Kristijan Lulic**

Persistence Length of Copolymers of Alkyl Methacrylates Probed by Pyrene Excimer Fluorescence

2:40 - 3:00

**Azin Adibi , Chemical Engineering, Waterloo**

Development of biopolymer coating with high barrier performance based on enzymatic polysaccharide and natural rubber for paper-based packaging applications

**(Winner of the 2022 IPR Award for Academic Excellence in Polymer Science/Engineering)**

3:00 -3:20

**Ryan Lloyd**

Interactions Between DNA and Pyrene-Labeled Gemini Surfactant Probed by Fluorescence and Dynamic Light Scattering

3:20-3:40

**Coffee**

3:40-4:00

**Franklin Frasca**

Conformation of Pyrene-Labeled Polyamines Established Through their Molecular Parameterization

4:00-4:20

**Sanjay Patel**

Conformation of PAMAM Dendrimers Probed by Pyrene Excimer Fluorescence

4:20-4:40

**Donghan Liu**

Conformation of Poly( $\gamma$ -Benzyl Glutamate) in Organic Solvents

4:45

**Closing remarks**

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- 23-001 **Electrospun nanofibers of chitosan/polyvinyl alcohol/UiO-66/ nanodiamond: Versatile adsorbents for wastewater remediation and organic dye removal**  
F. Ahmadjokani, H. Molavi, A. Bahi, S. Wuttke, M Kamkar, O. Rojas, F. Ko, M. Arjmand.  
Chemical Engineering Journal. 01/23
- 23-002 **Synergetic Effects of Alanine and Glycine in Blob-Based Methods for Predicting Protein Folding Times**  
R. Casier and J. Duhamel  
J. Phys. Chem. B. 01/23
- 23-003 **Deposition of Polymeric Sensing Materials for Gas Detection**  
B. Mavani, M. Arabi, R. Saritas, A. Scott, E .Abdel-Rahman, A. Penlidis  
Can. J. Chem. Eng. 01/23
- 23-004 **Multi-thermo Responsive Double Network Composite Hydrogel for 3D Printing Medical Hydrogel Mask**  
L. Bauman and B. Zhao  
Journal of Colloid & Interface Science. 01/23
- 23-005 **Multi-Stimuli Dually-Responsive Intelligent Woven Structures with Local Programmability for Biomimetic Applications**  
R. Xu, G. Wu, M. Jiang, S. Cao, M. Panahi-Sarmad,  
M. Kamkar, and X. Xiao  
Nano.Micro Small . Eng. 02/23
- 23-006 **Modeling of polymerization kinetics and molar mass development in the nitroxide-mediated polymerization (NMP) of styrene in supercritical carbon dioxide using the PC-SAFT equation of state**  
P. López-Domínguez, M. Ríos-López, J. Eduardo Rivera-Peláez, J. Fernando Barragán-Aroche, E. Vivaldo-Lima  
Canadian Journal of Chemical Engineering. 03/23
- 23-007 **Chitosan Grafted with Thermoresponsive Poly(di(ethylene glycol) Methyl Ether Methacrylate) for Cell Culture Applications**  
N. Dasgupta, D. Sun, M. Gorbet, and M. Gauthier  
Polymers. Eng. 03/23
- 23-008 **Unimolecular Micelles from Randomly Grafted Arborescent Copolymers with Different Core Branching Densities: Encapsulation of Doxorubicin and In Vitro Release Study**  
M. Alsehli and M. Gauthier  
Materials. Eng. 03/23
- 23-009 **Crystalline and Hairy Nanocelluloses for 3D Printed Hydrogels and Strongly Structured Cryogels**  
S. Ojagh, M. Amini, S. Cranmer-Smith, F. Vahabzadeh, M. Arjmand, C. Tam, O. Rojas, M. Kamkar, T. van de Ven  
ACS. 04/23

- 23-010      **Aquaporin-Based Biomimetic Membranes for Low Energy Water Desalination and Separation Applications**  
A. Azarafza, M. A. Islam, Y. Golpazirsorkheh, I. Efteghar, M. Sadrzadeh, M. Kamkar, A. F. Shojaei, M. Younas,\* T. M. Aminabhavi, and M. Rezakazemi  
AFM. 04/23
- 23-011      **Polyurethane-based membranes for CO<sub>2</sub> separation: A comprehensive review**  
F. Ahmadijokani , H. Molavi , S. Ahmadipouya, M. Rezakazemi , A. Ghaffarkhah , M. Kamkar, A. Shojaei , M. Arjmand  
Progress in Energy and Combustion Science. 04/23
- 23-012      **Direct milling: efficient, facile, and green method for processing fibrillated cellulose/polymeric nanocomposites with boosted thermomechanical and rheological performance**  
A. Jalaei, M. Kamkar, V. French , O. J. Rojas, E. J. Foster  
Carbohydrate Polymers. 04/23
- 23-013      **PERSISTENCE LENGTH AND ENCOUNTER FREQUENCY DETERMINATION FROM FLUORESCENCE STUDIES OF PYRENE-LABELED POLY(OLIGO(ETHYLENE GLYCOL) METHYL ETHER METHACRYLATE)S**  
H. Little, J. Thoma, R. Yeung, A. D'Sa, J. Duhamel  
Macromolecules. 04/23
- 23-014      **Super-Macroporous Lightweight Materials Templated from Bicontinuous Intra-Phase Jammed Emulsion Gels Based on Nanochitin**  
Y. Lu, M. Kamkar, S. Guo, X. Niu, Z. Wan, J. Xu, X. Su, Y. Fan, L. Bai, O. Rojas.  
Nano-Micro Small. 05/23
- 23-015      **Electrochemically synthesized graphene/TEMPO-oxidized cellulose nanofibrils hydrogels: Highly conductive green inks for 3D printing of robust structured EMI shielding aerogels**  
E. Erfanian, R. Moaref, R. Ajdary, K. Tam, O. Rojas, M. Kamkar, U. Sundararaj  
Carbon. 05/23
- 23-016      **Waste organic dye removal using MOF-based electrospun nanofibers of high amine density**  
F. Ahmadijokani, H. Molavi, M. Amini, A. Bahi, S. Wuttke, T. M. Aminabhavi, M. Kamkar, O. J. Rojas, F. Ko, M. Arjmand  
Chemical Engineering. 05/23
- 23-017      **Macromolecular Conformation of Low Generation PAMAM Dendrimers Probed by Pyrene Excimer Formation**  
S. Patel, and J. Duhamel  
Macromolecules. 05/23

- 23-018      **Characterization of Polyisobutylene Succinic Anhydride (PIBSA) and Its PIBSI Products from the Reaction of PIBSA with Hexamethylene Diamine**  
F. Fransca and J. Duhamel  
Polymers. 05/23
- 23-019      **Polymerizations in Supercritical Carbon Dioxide**  
E. Vivaldo-Lima and A. Penlidis  
Encyclopedia of Polymer Science and Technology. 05/23
- 23-020      **Synthesis and Characterization of Furan-Based Non-Ionic Surfactants (FBNIOS)**  
D. Liu, J. Duhamel, and M. Gauthier  
CSC conference. 06/23
- 23-021      **MOF-Based Electromagnetic Shields Multiscale Design: Nanoscale Chemistry, Microscale Assembly, and Macroscale Manufacturing**      D.  
M. Panahi-Sarmad, S. Samsami, A. Ghaffarkhah, S. Alireza Hashemi, S. Ghasemi, M. Amini, S. Wuttke, O. Rojas, K. Chiu Tam, F. Jiang, M. Arjmand, F. Ahmadijokani, and M. Kamkar  
Advanced Functional Materials. 06/23
- 23-022      **Organohydrogels with Cellulose Nanofibers Enhanced Supramolecular Interactions Toward High Performance Self-Adhesive Sensing Pads**  
C. Shan, L. Bauman, M. Che, A. Kim, R. Su, and B. Zhao  
Carbohydrate Polymers. 07/23
- 23-023      **Intra-Macromolecular Conformational Changes in Low Generation PAMAM Dendrimers Probed by Pyrene Excimer Formation**  
S. Payel, S. McNelles, A. Adronov, J. Duhamel  
J. Phys. Chem. B. 08/23
- 23-024      **Probing the Inner Local Density of Complex Macromolecules by Pyrene Excimer Formation**  
H. Little, S. Patel, and J. Duhamel  
Physical Chemistry Chemical Physics. 08/23
- 23-025      **An Early Study on the Synthesis of Lignin-Graft-(Net-Poly(acrylamide-co-N,N'methylenebisacrylamide)), Characterization of the Produced Copolymer, and Evaluation of Its Performance as Adsorbent for Lead Removal from Wastewater Purposes**  
M. Munguía-Quintero , M. Vega-Hernández, A. Rosas-Aburto , M. Hernández-Luna, S. López-Ramírez , J. Barragán-Aroche and E. Vivaldo-Lima  
Processes. 08/23
- 23-026      **Appraisal of Blob-Based Approaches in the Prediction of Protein Folding Times**  
R. Casier and J. Duhamel  
J. Phys. Chem. B. 09/23

- 23-027 **Persistence Length of PEGMA Bottle Brushes Determined by 2 Pyrene Excimer Fluorescence**  
J. Thoma, H. Little, J. Duhamel, L. Zhang, K. Keung  
Polymers. 9/23
- 23-028 **Influence of the Core Branching Density on Drug Release from Arborescent Poly( $\gamma$ -benzyl L-glutamate) End-Grafted with Poly(ethylene oxide)**  
M. Alsehli, and M. Gauthier  
International Journal of Translational Medicine. 12/23