

February 2015

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

NEWSLETTER 2014

1. NOTE FROM PROFESSOR JEAN DUHAMEL, IPR DIRECTOR

The IPR went through a number of administrative tasks in 2014. First, Melissa Meyer who had been the Administrative Coordinator, and thus the main contact point of the institute, for the past two years left us in July 2014 to start a new career. The great success of our past two IPR symposia were a result of the great care she placed in the planning and implementation of the numerous tasks that needed to be completed. The whole IPR community will certainly miss very much her good humour, the attention she put in her work, and her professional handling of all IPR business and wishes her all the best for her new endeavour. Melissa was replaced in August 2014 by Colleen Mechler who has quickly learned the ropes of the position and has already made her mark, notably by handling singlehandedly the IPR website. These new links, the ability for students to upload material for the IPR award competition, or the on-line registration for the next IPR symposium are all Colleen's doing, and we are extremely thankful for her having become our official webmaster beside her on-going duties as Administrative Coordinator of the institute. The second, minor, administrative matter that needed to be attended to in 2014 was my renewal as Director of the IPR after having completed (already) a first three year term. I want to take advantage of this year's newsletter to thank full-heartedly my fellow colleagues who have placed their trust in me to serve the institute for a second term.

As usual, last year's high point of the institute was the 36th annual IPR symposium which was held on May 21st, 2014. Dr. Guerino Sacripante from XRCC in Mississauga (ON) gave one of our two keynote talks on "Novel Sustainable Polymers from Natural Phenols and Rosin Acids". Our second keynote speaker was Prof. Harald Stover from the Department of Chemistry at McMaster University (ON). Hamed Shahsavan, one of our two IPR awardees, gave a presentation on his research entitled "Fabrication and Characterization of Bioinspired Functionally Graded Adhesive Materials". Bin Sun gave the second presentation as IPR awardee on "High performance polymer semiconductors for thin-film transistors". As director, I was delighted to see that no less than 25 students (a third of the total IPR student population) gave an oral presentation during the symposium. A good representation of students came to the poster session organized in the evening at the University Club with 11 poster presentations. I am always very much impressed by the high level of preparedness that our students put into their oral or poster presentation which allows for an excellent exchange of ideas among all attendees. The 2014 IPR symposium was sponsored by Malvern and a number of administrative units on campus which included the Departments of Chemical Engineering and Chemistry, the Faculties of Engineering and Science, and the Office of Research. The IPR community is thankful for their financial support. We were very happy to also host Dr. Niels Smeets from Ecosynthetix in Burlington (ON) as an industrial observer at our 2014 symposium.

There were a number of highlights for the IPR in 2014 which I have listed hereafter. Tyromer which uses and commercializes the technology invented by IPR long-serving colleague, Prof. Costas Tzoganakis, to recycle scrap tires won the prestigious TiE award from Silicon Valley given to 50 companies competing against thousands of others worldwide. This represented an impressive recognition of the importance of Costas' invention for developing a commercially viable and environmentally sound process for recycling scrap tires and the IPR community congratulates Costas for this remarkable achievement. In another category, Prof. Jamie Forrest presented the results of his group's research on polymer surface mobility in a glassy polymer in the prestigious journal *Science* **2014**, 343, 994-999. The IPR was also very

proud to host two excellent and well-attended presentations in 2014. The first presentation was held on May 8th, 2014 and was delivered by two researchers from the Cabot Corp., Drs. R. Sharma and M. Villalobos, who demonstrated quite elegantly how a thorough understanding of the interfacial energetics between particles and polymer matrix is necessary to produce stable composite materials. The second presentation was given on October 8th, 2014 by Prof. Xianshe Feng who discussed on the “Facilitated Transport Composite Membranes for Olefin/Paraffin Separation”. Finally 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).

For this year’s upcoming symposium, we are delighted to announce the two following keynote speakers; Dr. James Taylor from BASF in Wyandotte (MI, USA) and Dr. Doug McLaren from Imperial Oil in Sarnia (ON). Beside our annual IPR symposium to be held on May 6th, 2015, the IPR is also sponsoring a short course entitled “Troubleshooting Polymerizations” that will be taught by our colleagues, Prof. Alexander Penlidis and Costas Tzoganakis on June 22nd – 24th, 2015 included. I invite you to check our website for more information. To conclude this introduction to our 2015 newsletter, I speak on behalf of the entire IPR community that we very much look forward to welcoming you at the 2015 IPR symposium.

2. ANNUAL IPR SYMPOSIUM

The 37th Annual IPR Symposium will be held May 6, 2015. A schedule and registration forms have been circulated electronically, as usual.

Many thanks to all who participated in the 2014 Symposium (an audience of about 80 people). IPR received very positive feedback regarding the topics covered. The 2014 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 2014, the IPR office sent out 25 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	Fowler, M.	Characterization of behaviour of Solution-Responsive Polymer by Fluorescence
MASc	Chem	Yang, B.	Synthesis and characterization of temperature-response block copolymer of PMEO2MA and PEO prepared by ATRP for oil Recovery Applications
MASc	Chem	Yi, W.	Characterization of starch nanoparticles by fluorescence quenching

X. Feng

MASc	ChE	Guan, M.	Waste water treatment by adsorption and membranes
PhD	ChE	Zhang, Y.	Polyelectrolyte membranes for solvent dehydration by pervaporation

M. Gauthier

PhD	Chem	Aridi, T.	Synthesis of arborescent polymers by “click” grafting.
PDF	Chem	Moingeon, F.	Synthesis of photosensitive condensation polymers.
PhD	Chem	Whitton, G.	Arborescent copolymers based on amino acids for drug delivery.

Y. Li

MASc	ChE	Alsam, A.	Development of new nanostructurally engineered polymer semiconductors for organic electronics
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A. Penlidis

PhD	ChE	Izadi, H.	Polymers with tailor-made adhesive properties at nano-scale
PDF	ChE	Izadi, H.	Bio-inspired adhesives
PhD	ChE	Aardashti, P.	Property modifications of high density polyethylene
PhD	ChE	Amintowlieh, Y.	Imparting long chain branching in polypropylene via UV radiation
PhD	ChE	Kazemi, N.	Terpolymerization parameter estimation issues

M. Tam

PhD	ChE	Legros, C.	Engineering of poly(2-oxazoline)s for a potential use in biomedical applications
MASc	ChE	Zhang, F.	Syntheses of β -cyclodextrin functionalized cellulose nanocrystals and their interactions with amphiphilic compounds
PhD	ChE	Akhalghi, S.	Surface modification and characterization of cellulose nanocrystals for biomedical applications
PhD	ChE	Bacinello, D.	Hybrid polymer and peptide-based nanostructures for stimuli-responsive drug delivery

C. Tzoganakis

PhD	ChE	Sardashti, P.	Methodologies for obtaining reliable indicators for the environmental stress cracking resistance of polyethylene
PhD	ChE	Amintowlieh, Y.	Rheological modification of PP by incorporation of long chain branches using UV radiation
MASc	ChE	Saikia, A.	Modelling the vulcanization reaction of devulcanized rubber

E. Vivaldo-Lima

M.Sc.	Chem	Espinosa-Perez, L.	Modeling the copolymerization kinetics of vinyl/divinyl monomers for hydrogel formation in the presence of a RAFT controller
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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
	A. Penlidis	Chem. Eng.	Waterloo
	L.C. 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—2014

Currently we have **8 member companies**: (refer also Appendix 3)

Afton Chemical
BASF SE
Compuplast Canada Inc.
Lanxess Inc.
OMNOVA Solutions Inc.
PolyVation, The Netherlands
Princeton Polymer Consultants, USA
SABIC Europe, B.V.

9. STUDENT AWARDS

J. Duhamel

PhD student Solmaz Pirouz received a Doctoral Thesis Completion Award (Spring and Fall 2014).

Y. Li

Bin Sun (PhD student) received a WIN Nanofellowship

A. Penlidis

PhD student Yasaman Amintowlieh (PhD Dec 2014) received a Doctoral Thesis Completion Award (Spring and Fall 2014).

PhD student Marzieh Riahinezhad was selected (North America-wide, including Canada, USA and Mexico) to participate in the BASF USA Research Forum (Sept 2014), Iselin, NJ, USA; also received a doctoral thesis writing award, University of Waterloo, Aug 2014

PhD student, Pouyan Sardashti, received an extremely prestigious recognition, the 2014 Borealis Student Innovation Award (one award internationally)!

MASc student, Allison Scott, received (March 2014) a prestigious recognition in Canada, the CEMF award and scholarship for technical performance, leadership and extracurricular activities related to the promotion of Science and Engineering, especially among young female students (\$ 10,000).

X. Wang

Nimer Murshid received a WIN fellowship and an NSERC graduate scholarship.

B. Zhao

Hamed Shahsavan, WIN nanofellowship award for research excellence in nanotechnology, 2014

Hamed Shahsavan, David Johnston International Experience Award, 2014

Hamed Shahsavan, I-CAMP 2014 Summer School Fellowship, Annual Inter-continental Conference and Summer School in Advanced Materials and Photonics, from Institute for Complex Adaptive Matter ICAM, June 15-29, 2014.

10. FACULTY AWARDS

A. Penlidis

2009-2015 Canada Research Chair, Tier 1 (second 7 year period)

E. Vivaldo-Lima

Winner of the "IMIQ 2014 Award: "B.Eng. Estanislao Ramírez Ruiz" to the excellence in the teaching of Chemical Engineering", San Luis Potosí, S.L.P., México, October 2014. This is a prestigious lifelong award for excellence in the teaching of Chemical Engineering in Mexico. IMIQ is the equivalent to AIChE in USA or CScE in Canada.

A.Gauthier

Hubei Province High-end Foreign Experts Program Award, Huazhong University of Science and Technology, Wuhan, China (2012-2014).

11. FULL REFEREED JOURNAL PAPERS

J. Duhamel

Chen, S., H. Siu, J. Duhamel (2014). Interactions Between Hydrophobically Modified Alkali-Swellable Emulsion Polymers and Sodium Dodecyl Sulfate Probed by Fluorescence and Rheology. *J. Phys. Chem. B*, **118**, 351-361.

Duhamel, J (2014). Global Analysis of Fluorescence Decays to Probe the Internal Dynamics of Fluorescently Labeled Macromolecules. Invited Instructional Review, *Langmuir*, **30**, 2307-2324. (Cover Article)

Pirouz, S., Y. Wang, J.M. Chong, J. Duhamel (2014). Characterization of the Chemical Composition of Polyisobutylene-Based Oil-Soluble Dispersants by Fluorescence. *J. Phys. Chem. B*, **118**, 3899-3911.

Zaragoza-Galán, G., M. Fowler, R. Rein, N. Solladié, J. Duhamel, E. Rivera (2014). Fluorescence Resonance Energy Transfer in Partially and Fully Labeled Pyrene Dendronized Porphyrins Studied with Model Free Analysis. *E. J. Phys. Chem. C*, **118**, 8280-8294.

Chen, S., J. Duhamel, B. Peng, M. Zaman, K.C. Tam (2014). Interactions between a Series of Pyrene End-Labeled Poly(ethylene oxide)s and Sodium Dodecyl Sulfate in Aqueous Solution Probed by Fluorescence. *Langmuir*, **30**, 13164-13175.

X. Feng

Huang, W.Y., S. Yu, D. Lawless, X. Feng (2014). Thin Film Composite Nanofiltration Membranes Assembled Layer-by-Layer via Interfacial Polymerization from Polyethylenimine and Trimesoyl Chloride. *Journal of Membrane Science*, 472, 141-153.

Khosa, M.A., S.S. Shah, X. Feng (2014). Thermodynamic Functions of Metal–Sericin Complexation in Ultrafiltration Study. *Journal of Membrane Science*, 470, 1–8.

Sampranpiboon*, P., P. Charnkeikong, X. Feng (2014). Determination of Thermodynamic Parameters of Zinc (II) Adsorption on Pulp Waste as Biosorbent. *Advanced Materials Research*, 931-932, 215-219.

Wang, Z., Y. Feng, X. Hao, W. Huang, X. Feng (2014). A Novel Potential-Responsive Ion Exchange Film System for Heavy Metal Removal. *Journal of Materials Chemistry A*, 2, 10263–10272.

Khosa, M.A., S.S. Shah, X. Feng (2014). Metal-Sericin Complexation and Ultrafiltration of Heavy Metals from Aqueous Solution. *Chemical Engineering Journal*, 244, 446-456.

Du, J.R., W. Du, X. Feng, Y. Zhang, Y. Wu (2014). Membrane Distillation Enhanced by an Asymmetric Electric Field. *AIChE Journal*, 60, 2307–2313.

Wang, X., X. Deng, Z. Bai, X. Zhang, X. Feng, W. Huang (2014). The Synthesis of Super-Hydrophilic and Acid-Proof Ge–ZSM-5 Membranes by Simultaneous Incorporation of Ge and Al into a Silicalite-1 Framework. *Journal of Membrane Science*, 468, 202–208.

Kundu, P.K., A. Chakma, A., X. Feng (2014). Effectiveness of Membranes and Hybrid Membrane Processes in Comparison with Absorption Using Amines for Post-Combustion CO₂ Capture. *International Journal of Greenhouse Gas Control*, 28, 248-256.

Chen, Y., D. Lawless, X. Feng (2014). Pressure-Vacuum Swing Permeation: a Novel Process Mode for Membrane Separation of Gases. *Separation and Purification Technology*, 125, 301–310.

Sampranpiboon, P., P. Charnkeikong, X. Feng (2014). Equilibrium Isotherm Models for Adsorption of Zinc (II) Ion from Aqueous Solution on Pulp Waste. *WSEAS Transactions on Environment and Development*, 10, 35-47.

Zhang, X., C. Li, X. Hao, X. Feng, H. Zhang, H. Hou, G. Liang(2014). Recovering Phenol as High Purity Crystals from Dilute Aqueous Solutions by Pervaporation. *Chemical Engineering Science*, 108, 183-187.

Sun, A.C., W. Kosar, Y. Zhang, X. Feng (2014). Vacuum Membrane Distillation for Desalination of Water Using Hollow Fiber Membranes. *Journal of Membrane Science*, 455, 131–142.

M. Gauthier

Nguon, O., M. Gauthier, V. Karanassios,(2014). Determination of the Loading and Stability of Pd in an Arborescent Copolymer in Ethanol by Microplasma – Optical Emission Spectrometry. *RSC Adv.*, 4, 8978-8984.

Dockendorff, J., M. Gauthier (2014). Synthesis of Arborescent Polystyrene-g-[Poly(2-vinylpyridine)-b-Polystyrene] Core–Shell–Corona Copolymers. *J. Polym. Sci., Part A: Polym. Chem.* 52, 1075-1085.

Cao, K., J. Ward, R.C. Amos, M.G. Jeong, K.T. Kim, M. Gauthier, D. Foucher, X. Wang (2014). Organometallic Macromolecules with Piano Stool Coordination Repeating Units: Chain Configuration and Stimulated Solution Behaviour, *Chem. Commun. (Cambridge, UK)* 50, 10062-10065.

Truzzolillo, D., D. Vlassopoulos, A. Munam, M. Gauthier (2014). Depletion Gels from Soft Colloids : Rheology and Thermoreversible Melting. *J. Rheol.* 58, 1441-1462.

Nguyen, V. T. A., M. Gauthier, O. Sandre (2014). Templated Synthesis of Magnetic Nanoparticles through Through the Self-Assembly of Polymers and Surfactants. *Nanomaterials*, 4, 628-685.

Aly, M. A. S., M. Gauthier, J. Yeow (2014). Lysis of Gram-positive and Gram-negative Bacteria by Antibacterial Porous Polymeric Monolith Formed in Microfluidic Biochips for Sample Preparation. *Anal. Bioanal. Chem.*, 406, 5977-5987.

Nguyen, T. X., L. Huang, L. Liu, A.M. Elamin Abdalla, M. Gauthier, G. Yang (2014). Chitosan-Coated Nano-Liposomes for the Oral Delivery of Berberine Hydrochloride. *J. Mater. Chem. B*, 2, 7149-7159.

Y. Li

Morin, P., T. Bura, B. Sun, S.I. Gorelsky, Y. Li, M. Leclerc (2015). Conjugated Polymers à la Carte from Time-Controlled Direct (Hetero) Arylation Polymerization. *ACS Macro Lett.* 4, 21-24.

Sun, B., W. Hong, E., Thibau, H. Aziz, Z. H. Lu, Y. Li (2014). Facile Conversion of Ambipolar and p-Type Polymers into Unipolar n-Type Polymers in Organic Thin Film Transistors Using Polyethyleneimine (PEI)-Modified Electrodes. *Organic Electronics*, 15, 3787-3794.

Sun, B., W. Hong, H. Aziz, Y. Li (2014). A Pyridine-Flanked Diketopyrrolopyrrole (DPP)-Based Donor-Acceptor Polymer Showing High Mobility in Ambipolar and n-Channel Organic Thin Film Transistors. *Polymer Chemistry*, 10.1039/C4PY01193G.

Pouliot, J. R., B. Sun, M. Leduc, A. Najari, Y. Li, M. Leclerc (2014). A High Mobility DPP-Based Polymer Obtained via Direct (Hetero)arylation Polymerization. *Polym. Chem.*, 6, 278-282.

He, Y., W. Hong, Y. Li (2014). New Building Blocks for π -Conjugated Polymer Semiconductors for Organic Thin Film Transistors and Photovoltaics. *J. Mater. Chem. C*, 2, 8651-8661.

Yang, Y., Y. Li, M. Pritzker (2014). Morphological Evolution of Anodic TiO₂ Nanotubes, *RSC Adv.*, 4, 35833-35843.

Yan, Z., B. Sun, C. Guo, Y. Li (2014). Synthesis and Properties of Azothiazole Based π -Conjugated Polymers. *J. Mater. Chem. C*, 2, 7096-7103.

Guo, C., B. Sun, Y. Li (2014). Synthesis and Properties of Pyrrolo[3,4-c]pyrrole-1,3-dione Based Polymer Semiconductors and Their Performance in Organic Thin Film Transistors. *Polym. Chem.* 5, 5247-5254.

Chen, S., B. Sun, C. Guo, W. Hong, Y. Meng, Y. Li (2014). 3, 3'-(Ethane-1, 2-diylidene)bis(indolin-2-one) Based Conjugated Polymers for Organic Thin Film Transistors. *Chem. Commun.*, 50, 6509-6512.

Guo, G., B. Sun, Z. Yan, Y. Li (2014). Synthesis and Properties of Indigo Based Donor-acceptor Conjugated Polymers. *J. Mater. Chem. C*, 2, 4289-4296.

Sun, B., W. Hong, Z. Yan, H. Aziz, Y. Li (2014). Record High Electron Mobility of 6.3 cm²V⁻¹s⁻¹ Achieved for Polymer Semiconductors Using a New Building Block. *Adv. Mater.* 26, 2636-2642.

Xiao, P., W. Hong, Y. Li, F. Dumur, B. Graff, J.P. Fouassier, D. Gignes, J. Lalevée (2014). Diketopyrrolopyrrole Dyes: Structure/Reactivity/Efficiency Relationship in Photoinitiating Systems upon Visible Lights. *Polymer*, 55, 746-751.

Chen, S., B. Sun, W. Hong, H. Aziz, Y. Meng, Y. Li (2014). Influences of Side Chain Length and Bifurcation Point on Crystalline Structure and Charge Transport of Diketopyrrolopyrrole-Quaterthiophene Copolymers (PDQTs). *J. Mat. Chem. C.*, 2, 2183-2190.

Xiao, P. , W. Hong, Y. Li, F. Dumur, B. Graff, J.P. Fouassier, D. Gimes, J. Lalevée (2014). Green Light Sensitive Diketopyrrolopyrrole Derivatives Used in Versatile Photoinitiating Systems for Photopolymerizations. *Polym. Chem.* 5, 2293-2300.

Chen, S., B. Sun, W. Hong, Z. Yan, H. Aziz, Y. Meng, J. Hollinger, D. Seferos, Y. Li (2014). Impact of *N*-Substitution of a Carbazole Unit on Molecular Packing and Charge Transport of DPP-carbazole Copolymers. *J. Mater. Chem. C*, 2, 1683-1690.

N. McManus

Riahinezhad, M., N. McManus, A. Penlidis (2014). Effect of Monomer Concentration and pH on Reaction Kinetics and Copolymer Microstructure of Acrylamide/Acrylic Acid Copolymer. *Macromol. React. Eng.*

Riahinezhad, M., M.N. Kazemi, A. Penlidis, N. McManus (2014). Effect of Ionic Strength on the Reactivity Ratios of Acrylamide/Acrylic Acid Copolymerization. *J. App. Polym. Sci.*, 10.1002/app.40948.

Scott, A.J., A. Nabifar, J.C. Hernandez-Ortiz, N. McManus, E. Vivaldo-Lima. A. Penlidis (2014) Crosslinking Nitroxide-Mediated Radical Copolymerization of Styrene with Divinylbenzene. *European Polymer Journal* 51, 87-111.

A. Penlidis

Riahinezhad, M., N. McManus, A. Penlidis (2014). Effect of Monomer Concentration and pH on Reaction Kinetics and Copolymer Microstructure of Acrylamide/Acrylic Acid Copolymer. *Macromol. React. Eng.*

Kazemi, N., T.A. Duever, A. Penlidis (2014). Design of Optimal Experiments for Terpolymerization Reactivity Ratio Estimation. *Macromol. React. Eng.*

Amintowlieh, Y., C. Tzoganakis, A. Penlidis (2014). Preparation and Characterization of Long Chain Branched Polypropylene through UV Irradiation and Coagent Use. *Polymer-Plastics Technology and Engineering*.

Scott, A.J, A. Nabifar, C.M. Madhuranthakam, A. Penlidis (2014). Bayesian Design of Experiments Applied to a Complex Polymerization System: Nitrile Butadiene Rubber Production in a Train of CSTRs. *Macromol. Theory and Simul.*

Sardashti, P., C. Tzoganakis, M. Zatloukal, M.A. Polak, A. Penlidis (2014). Rheological Indicators for Environmental Stress Cracking Resistance of Polyethylene. *Intern. Polymer Processing (IPP)*.

Izadi, H., K.M.E. Stewart, A. Penlidis (2014). Role of Contact Electrification and Electrostatic Interactions in Gecko Adhesion. *J. Roy. Soc. Interface*, 11 (98), 371-374.

Amintowlieh, Y., C. Tzoganakis, A. Penlidis (2014). The Effect of Depth and Duration of UV Radiation on Polypropylene Modification via Photoinitiation. *J. Appl. Polym. Sci.*, 131, 41021-41031 doi 10.1002/APP.41021.

Riahinezhad, M., N. Kazemi, N.T. McManus, A. Penlidis (2014). Effect of Ionic Strength on the Reactivity Ratios of Acrylamide/ Acrylic Acid (sodium acrylate) Copolymerization. *J. Appl. Polym. Sci.*

Khater, M.E., M. Al-Ghamdi, S. Park, K.M.E Stewart, E.M. Abdel-Rahman, A. Penlidis, A.H. Nayfeh, A.K.S. Abdel-Aziz and M. Basha (2014). Binary MEMS Gas Sensors. *J. Micromechanics and Microengineering (JMM)*, 24 (6), 5007-5015.

Hernandez-Ortiz, J.C., E. Vivaldo-Lima, M.A. Dube, A. Penlidis (2014). Modeling of Network Formation in the Atom Transfer Radical Copolymerization (ATRP) of Vinyl/divinyl Monomers using a Multifunctional Polymer Molecule Approach. *Macromol. Theory Simul.*

Scott, A.J., A. Nabifar, A. Penlidis (2014). Branched and Crosslinked Polymers Synthesized through NMRP: Quantitative Indicators for Network Homogeneity. *Macromol. React. Eng.*, 8 (9), 639-657. **Featured in Materials Views.**

Amintowlieh, Y., C. Tzoganakis, S. Hatzikiriakos, A. Penlidis (2014). Effects of Processing Variables on Polypropylene Degradation and Long Chain Branching with UV Irradiation. *Polymer Degrad. and Stability*, 104, 1-10.

Kazemi, N., T.A. Duever, A. Penlidis (2014). Demystifying the estimation of reactivity ratios for terpolymerization systems. *AIChE J.*, 60 (5), 1752-1766.

Hernandez-Ortiz, J.C., E. Vivaldo-Lima, M.A. Dube, A. Penlidis (2014). Modelling of Network Formation in Reversible Addition-Fragmentation Transfer (RAFT) Copolymerization of Vinyl/divinyl Monomers Using a Multifunctional Polymer Molecule Approach. *Macromol. Theory and Simul.*, 23 (3), 147-169.

Charbonneau, L., M.A. Polak, A. Penlidis (2014). Mechanical Properties of ETFE Foils: Testing and Modelling. *Constr. and Build. Mat.*, 60, 63-72.

Kazemi, N., B.H. Lessard, M. Maric, T.A. Duever, A. Penlidis (2014). Reactivity Ratio Estimation In Radical Copolymerization: From Preliminary Estimates to Optimal Design of Experiments. *Ind. & Eng. Chem. Res.*, 53 (18), 7305-7312.

Scott, A.J., A. Nabifar, J.C. Hernandez-Ortiz, N.T. McManus, E. Vivaldo-Lima, E., A. Penlidis (2014). Crosslinking Nitroxide-Mediated Radical Polymerization of Styrene with Divinylbenzene. *Eur. Polym. J.*, 51, 87-111.

M. Tam

Suh, Y.H., B.J. Kim, K.C. Tam, M.G. Aucoin (2014). Detection and Characterization of Hemoglobin Dissociation and Aggregation Using Microcalorimetry. *Journal of Thermal Analysis and Calorimetry*, 115, 2159-2169.

Natarajan, J.V., A. Darwitan, V. A. Barathi, M. Ang, H. M. Hoon, F. Boey, K.C. Tam, T.T. Wong, S.S. Venkatraman (2014.) Sustained Drug Release in Nanomedicine: A Long-Acting Nanocarrier-Based Formulation for Glaucoma. *ACS Nano*, 8, 419-429.

Chen, L., R. Berry, K.C. Tam (2014). Synthesis of β -Cyclodextrin Modified Cellulose Nanocrystals (CNCs@Fe₃O₄@SiO₂) Superparamagnetic Nanorods. *ACS Sustainable Chemistry & Engineering*, 2 (4), 951-958.

Batmaz, R., N. Mohammed, M. Zaman, G. Minhas, R.M. Berry, K.C. Tam, K.C (2014). Cellulose Nanocrystals as Promising Adsorbents for the Removal of Cationic Dyes. *Cellulose*, 21, 1655-1665.

Bacinello, D., E. Garanger, D. Taton, K.C. Tam, S. Lecommandoux (2014). Enzyme-Degradable Self-Assembled Nanostructures from Polymer-Peptide Hybrids. *Biomacromolecules* 15 (5), 1882–1888.

Tian, Y., T.A. Hatton, K.C. Tam (2014). Dissociation and Thermal Characteristics of Poly(acrylic acid) Modified Pluronic Block copolymers in Aqueous Solution. *Polymer*, 55, 3886-3893.

Khoury, S., M. Shams, K.C. Tam (2014). Determination and Prediction of Physical Properties of Cellulose Nanocrystals from Dynamic Light Scattering Measurements. *Journal of Nanoparticle Research*, 16, 1-14.

Wu, X., V.L. Chabot, B.K. Kim, A. P. Yu, R.M. Berry, K.C. Tam (2014). Cost-effective and Scalable Chemical Synthesis of Conductive Cellulose Nanocrystals for High-performance Supercapacitors. *Electrochimica Acta.*, 138, 139–147.

Akhlaghi, S.P., D. Tiong, R. Berry, K.C. Tam (2014). Comparative Release Studies of Two Cationic Model Drugs from Different Cellulose Nanocrystal Derivatives. *European Journal of Pharmaceutics and Biopharmaceutics*, 88, 207-215.

Tang, J., M.F.X. Lee, W. Zhang, B. Zhao, R.M. Berry, K.C. Tam (2014). Dual Responsive Pickering Emulsion Stabilized by Poly [2-(dimethylamino)ethyl methacrylate] (PDMAEMA) Grafted Cellulose Nanocrystals. *Biomacromolecules*, 15, 3052–3060.

Tang, J., Y. Song, R.M. Berry, K.C. Tam (2014). Polyrhodanine Coated Cellulose Nanocrystals as Optical pH Indicators. *RSC Advances* 4, 104, 60249-60252.

Akhlaghi, S.P., R. Berry, K.C. Tam (2014) Cellulose Nanocrystal Grafted Chitosan Oligosaccharide: A Novel Green Antioxidant for Vitamin C Delivery. *AAPS PharmSciTech*, [dx.doi.org/10.1208/s12249-014-0218-4](https://doi.org/10.1208/s12249-014-0218-4), p1-9.

Wu, X., J. Tang, Y. Duan, A.P. Yu, R.M. Berry, K.C. Tam (2014). Conductive Cellulose Nanocrystals with High Cycling Stability for Supercapacitor Applications. *Journal of Materials Chemistry* 2, 45, 19268-19274.

Chen S., J. Duhamel, P. Peng, M. Zaman, K.C. Tam (2014). Interactions between a Series of Pyrene End-Labeled Poly(ethylene oxide)s and Sodium Dodecyl Sulfate in Aqueous Solution Probed by Fluorescence. *Langmuir*, 30 (44), 13164-13175.

Bacinello, D., E. Garanger, D. Taton, K.C. Tam, S. Lecommandoux (2014). Tailored Drug-Release from Multi-Functional Polymer-Peptide Hybrid Vesicles. *European Polymer Journal*, 62, 363-373.

Legros, C., M.C. Gillet De Pauw, K.C. Tam, S. Lecommandoux, D. Taton (2014). Aldehyde-functional Copolymers Based on Poly(2-oxazoline) for post-polymerization modification. *European Polymer Journal*, 62, 322-330.

Shi, Z., J. Tang, L. Chen, C. Yan, S. Tanvir, W.A. Anderson, R.M. Berry, K.C. Tam (2014). Enhanced Colloidal Stability and Antibacterial Performance of Silver Nanoparticles/Cellulose Nanocrystal Hybrids. *Journal of Materials Chemistry B*, 3, 603-611

Legros, C., A. Wirotius, M.C. Gillet De Pauw, K.C. Tam, D. Taton, S. Lecommandoux (2014). Poly(2-oxazoline) based Nanogels as Biocompatible Pseudo-Polypeptide Nanoparticles. *Biomacromolecules*, 16, 183-191.

Mathiyazhakana, M., Y. Yanga, Y. Liu, C. Zhua, Q. Liu, C.D. Ohi, K.C. Tam, Y. Gao, C. Xu (2014). Non-Invasive Controlled Release from Gold Nanoparticle Integrated Photo-Responsive Liposomes Through Pulse Laser Induced Microbubble Cavitation. *Colloids and Surfaces B: Biointerfaces*, 126, 569-74..

C. Tzoganakis

Sardashti, P, C. Tzoganakis, A. Penlidis (2014). Rheological Indicators for Environmental Stress Cracking Resistance of Polyethylene. Accepted in *International Polymer Processing*.

Amintowlieh, Y., C. Tzoganaki, A. Penlidis (2014). Long Chain Branching of Polypropylene through UV Irradiation and Coagent Use". Accepted in *Polymer- Plastics Technology and Engineering*.

Amintowlieh, Y., C. Tzoganakis, A. Penlidis (2014). The Effect of Depth and Duration of UV Radiation on Polypropylene Modification via Photoinitiation. *J. Appl. Polym. Sci.*, 131, 41021-41032.

Amintowlieh, Y., C. Tzoganakis, S.G. Hatzikiriakos, A. Penlidis (2014). Effects of Processing Variables on Polypropylene Degradation and Long Chain Branching with UV Irradiation. *Polymer Degradation and Stability*, 104, 1-10.

E. Vivaldo-Lima

Hernández-Ortiz, J.C., E. Vivaldo-Lima, M.A. Dubé, A. Penlidis (2014). Modeling of Network Formation in the Atom Transfer Radical Co-polymerization (ATRP) of Vinyl/Divinyl Monomers Using a Multifunctional Polymer Molecule Approach. *Macromol. Theory Simul.*, 23(7), 429-441.

Espinosa-Pérez, L., J.C. Hernández-Ortiz, P. Rosas-Aburto, A. Licea-Claverie, H. Vázquez-Torres, H, M.J, Bernad-Bernad (2014). Modeling of the Production of Hydrogels from Hydroxyethyl Methacrylate (HEMA) and (Di)Ethylene Glycol Dimethacrylate (EGDMA or DEGDMA) in the Presence of RAFT Agents. *Macromol. React. Eng.*, 8(8), 564-579.

Vandenbossche, V., J. Brault, G. Vilarem, O. Hernández-Meléndez, E. Vivaldo-Lima, M. Hernández-Luna, E. Barzana, A. Duque, P. Manzanares, M. Ballesteros, J. Mata, E. Castellón, L. Rigal (2014). A New Lignocellulosic Biomass Deconstruction Process Combining Thermo-Mechano Chemical Action and Bio-Catalytic Enzymatic Hydrolysis in a Twin-Screw Extruder. *Ind. Crop. Prod.*, 55, 258-266.

Hernández-Ortiz, J.C., E. Vivaldo-Lima, M.A. Dubé, A. Penlidis (2014). Modeling of Network Formation in Reversible Addition-Fragmentation Transfer (RAFT) Copolymerization of Vinyl/Divinyl Monomers Using a Multifunctional Polymer Molecule Approach. *Macromol. Theory Simul.*, 23(3), 147-169.

Scott, A.J., A. Nabifar, J.C. Hernández-Ortiz, M.T. McManus, E. Vivaldo-Lima, A. Penlidis (2014). Crosslinking Nitroxide-Mediated Radical Copolymerization of Styrene with Divinylbenzene. *Eur. Polym. J.*, 51, 87-111.

López-Domínguez, P., J.C. Hernandez-Ortiz, K.J. Barlow, E. Vivaldo-Lima, G. Moad (2014). Modeling the Kinetics of Monolith Formation by RAFT Copolymerization of Styrene and Divinylbenzene, *Macromol. React. Eng.*, 8(10), 706-722.

X. Wang

Cao, K., N. Murshid, X.S. Wang (2014). Synthesis of Main-Chain Metal Carbonyl Organometallic Macromolecules (MCMCOMs). *Macromol. Rapid. Commun.* (ahead of print).

Lanigan, N., A. Assoud, X.S. Wang (2014). Intermolecular Interactions of CpFePPh₃(CO)CO(CH₂)₅CH₃: From a Crystalline Solid to a Supramolecular “Iron-Truss” Polymer. *ACS Macro Lett.* **3**, 1281–1285.

Liu, J., K. Cao, B. Nayyar, X.H. Tian, X. S. Wang (2014). Synthesis and Migration Insertion Polymerization (MIP) of CpFe(CO)₂(CH₂)₆PPh₂ (FpC6P) for PFpC6P: Macromolecule Stability, Degradability and Redox Activity. *Polymer Chemistry*, **5**, 6702-6709.

Cao, K., J. Ward, R.C. Amos, M.G. Jeong, K.T. Kim, M. Gauthier, D. Foucher, X.S. Wang (2014). Organometallic Macromolecules with Piano Stool Coordination Repeating Units: Chain Configuration and Stimulated Solution Behavior. *Chem. Commun.* **50**, 10062-10065.

Cao, K., B. Tsang, Y.B. Liu, D. Chelladural, W.P. Power, X.S. Wang (2014). Synthesis, Cyclization, and Migration Insertion Oligomerization of CpFe(CO)₂(CH₂)₃PPh₂ in Solution. *Organometallics* **33** (2), 531–539.

B. Zhao

Amoli, B., A. Hu, Y. Zhou, B. Zhao (2014). Decoration of Graphene with Thiocarboxylic Functionalized Ag Nanoparticles for Electrically Conductive Nanocomposites. *J. Materials Science: Materials in Electronics*, **10**.1007/s10854-014-2440-y.

Marzbanrad, E., P. Peng, G. Rivers, B. Zhao, Y. Zhou (2014). Silver Nanobelts as a High-temperature Alternative to Pentagonal Silver Nanowires: How surface crystallography affects thermal stability. *Physical Chemistry Chemical Physics*, **17**(1):315-24.

Pan, Z., H. Shahsavan*, W. Zhang, F.K. Yang, B. Zhao (2014). Superhydro-oleophobic Bio-inspired Polydimethylsiloxane Micropillared Surface via FDS Coating/Blending Approaches. *Applied Surface Science*, **324**, 612-620.

Sun, S., Y. Huang, B. Zhao (2014). Formation of Silica Colloidal Crystals on Soft Hydrophobic vs Rigid Hydrophilic Surfaces. *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, **467**, 180-187.

Tang, J., M. Lee, W. Zhang, B. Zhao, R. Berry, K. Tam (2014). Dual Responsive Pickering Emulsion Stabilized by Poly[2-(dimethylamino)ethyl methacrylate] Grafted Cellulose Nanocrystals. *Biomacromolecules*, **15** (8), 3052-3060.

Cholewinski, A., J. Trinidad, B. McDonald, B. Zhao (2014). Bio-inspired Polydimethylsiloxane-Functionalized Silica Particles - Epoxy Bilayer as a Robust Superhydrophobic Surface Coating. *Surface and Coatings Technology*, **254**, 230-237.

13. CONFERENCE PRESENTATIONS/INVITED SEMINARS

J. Duhamel

Chen, S., J. Duhamel (2014). Pyrene Excimer Fluorescence to Characterize the Interactions of Pyrene End-Labeled Poly(ethylene oxide) in Aqueous Solution. XXIII IMRC, Cancun, Mexico, August 17-21, 2014.

Duhamel, J. (2014). Internal Dynamics of Macromolecules Probed Quantitatively by Pyrene Excimer Fluorescence. 4th Annual World Congress of Nanoscience and Nanotechnology, Qingdao, China, October 28 – 30, 2014.

Duhamel, J. (2014). Internal Dynamics of Macromolecules Probed Quantitatively by Pyrene Excimer Fluorescence. Department of Chemistry, University of Guelph, Guelph, November 13, 2014.

X. Feng

Sampranpiboon, P., X. Feng (2014). The Use of Carbonization Products of Oil Palm Kernel Activated by Phosphoric Acid and Sodium Hydroxide for Chromium (VI) Removal. Presented at the 4th TICHE International Conference “Changes: Cleaner Energy, Leaner Processes, Better Living,” Chiang Mai, Thailand, Dec 18-19, 2014.

Wu, D., X. Xu, X. Feng (2014). Fabrication of Poly(Vinylidene Fluoride)/Polyamide Nanoblend Membranes for Improved Water Flux. Presented at the 64th Canadian Chemical Engineering Conference, Niagara Falls, ON, Oct. 19-22, 2014.

Wu, D. X. Feng, D. Lawless (2014). Thin Film Composite Nanofiltration Membranes Assembled Layer-by-Layer Vialinterfacial Polymerization. Presented at the 64th Canadian Chemical Engineering Conference, Niagara Falls, ON, Oct. 19-22, 2014.

Huang, Y., X. Feng, Z. Tan (2014). Polyvinylamine-Enhanced Ultrafiltration for Mercury (II) Removal. Presented at the 64th Canadian Chemical Engineering Conference, Niagara Falls, ON, Oct 19-22, 2014.

Zhang, B., X. Feng, K. Hu(2014). Pervaporative Extraction of Dairy Flavor Compounds by Membranes. Presented at the 64th Canadian Chemical Engineering Conference, Niagara Falls, ON, Oct 19-22, 2014.

Lai, S., X. Feng (2014) Removal of Phenolic Compounds from Wastewater By a Polymeric Adsorbent. Presented at the 64th Canadian Chemical Engineering Conference, Niagara Falls, ON, Oct 19-22, 2014.

Du, J.R. , G. Francisco, K. Hu, X. Feng, X. Wang (2014). Extraction of Aroma Compounds in Coffee by Pervaporation. Presented at the 2014 International Congress on Membranes and Membrane Processes (ICOM 2014), Suzhou, China, July 20-25, 2014.

Zhang, X.-R. , Y.-H. Wang, C.-C. Li, X.-G. Hao, X. Feng (2014). Recovering Phenol as High Purity Crystals from Dilute Aqueous Solutions by Pervaporation-Crystallization Coupling Process. Presented at the 2014 International Congress on Membranes and Membrane Processes (ICOM 2014), Suzhou, China, July 20-25, 2014.

Feng, X. (2014). Cyclic Pressure-Vacuum Swing Permeation for Gas Separation. Invited Keynote Presentation at the 2014 International Congress on Membranes and Membrane Processes (ICOM 2014), Suzhou, China, July 20-25, 2014.

Sampranpiboon, P., P. Charnkeitkong, X. Feng (2014). Determination of Thermodynamic Parameters of Zinc (II) Adsorption on Pulp Waste as Biosorbent. Presented the 5th KKU International Engineering Conference, Khon Kaen, Thailand, Mar 27 - 29, 2014.

Feng, X. (2014). Polymer-Enhanced Ultrafiltration for Wastewater Treatment. Presented at Zhaojin Motian Membrane Co., Ltd., Zhaoyuan, China, Dec 18, 2014. (Invited)

Feng, X. (2014). Removal of Heavy Metals from Wastewater by Polymer-Enhanced Ultrafiltration. Presented at School of Chemistry and Chemical Engineering, Huazhong University of Science & Technology, Wuhan, China, Dec 12, 2014. (Invited)

Feng, X. (2014). Olefin/Paraffin Separation by Facilitated Transport Membranes. Presented at School of Chemistry and Chemical Engineering, Huazhong University of Science & Technology, Wuhan, China, Dec 11, 2014. (Invited)

Feng, X. (2014). Facilitated Transport for Olefin/Paraffin Separation. Presented at College of Chemistry, Chem Eng & Materials Science, Suzhou University, Suzhou, China, July 23, 2014. (Invited)

Feng, X. (2014). Nanostructured Membranes for Olefin/Paraffin Separation. Presented at Dept. of Chemistry, University of Science and Technology of China, Hefei, China, July 15, 2014. (Invited)

Feng, X. (2014). Removal of Heavy Metals from Wastewater Using Polymer-Enhanced Ultrafiltration. Presented at School of Chem. Eng. and Technology, Harbin Institute of Technology, Harbin, China, July 11, 2014. (Invited)

Feng, X. (2014). Olefin/Paraffin Separation: The Membrane Solution. Presented at SINOPEC Beijing Research Institute of Chemical Industry, Beijing, July 9, 2014. (Invited)

Feng, X. (2014). Recent Advances in Olefin/Paraffin Separation by Facilitated Transport. Presented at the Dept of Chemical and Biomolecular Engineering, National University of Singapore, Singapore, May 6, 2014. (Invited)

M. Gauthier

Gauthier, M. (2014). Arborescent Polypeptides as Unimolecular Micelles for Drug Delivery. Sino-German Bilateral Symposium on Bioinspired Materials Science and Engineering, May 2014, Wuhan, China.

Gauthier, M. (2014). Hydrophobic Modification of Starch Nanoparticles for Drug Delivery. 3rd Canada-Brazil Workshop on Sustainable Nanomaterials, May 2014, Belo Horizonte, Brazil.

Gauthier, M. (2014). Complex Branched Copolymer Architectures through Polyion Complex (PIC) Formation. 23rd International Materials Research Conference, August 2014, Cancún, México

Gauthier, M. (2014). "Novel "Smart" Nano-sized Composite Micelle System (CMS) for Tumor Targeting Delivery". 247th ACS National Meeting & Exposition, March 2014, Dallas, TX.

Gauthier, M. (2014). Microplasmas: From Applications to Fundamentals Next-Generation Spectroscopic Technologies VII (SPIE), May 2014, Baltimore, MD.

Gauthier, M. (2014). Formation of Thermo-Responsive, Water-Soluble Micelles by Complexation of Arborescent Copolymers and Double-Hydrophilic Block Copolymers. 36th Canadian High Polymer Forum, August 2014, Gananoque, ON.

Gauthier, M. (2014). Development of Weak Cation Exchange Membrane Adsorber Materials for Protein Capture. 64th Canadian Chemical Engineering Conference, October 2014, Niagara Falls, ON.

Gauthier, M. (2014). Magnetic Micelles as Therapy and Diagnostic Agents. 248th ACS National Meeting & Exposition, August 2014, San Francisco, CA.

Y. Li

Li, Y. (2014) Development of High Performance Polymer Semiconductors for Printed Electronics. College of Chemical Engineering, Dalian University of technology, Dalian, China, Dec 25, 2014.

Sun, B., W. Hong, H. Aziz, Y. Li (2014). A New Polymer Semiconductor with Record Electron Mobility for Organic Thin-Film Transistors. MRS Fall Meeting, November 30-December 5, Boston. Invited

Sun, B., W. Hong, H. Aziz, Y. Li (2014). Molecular Ordering and Charge Transport Improvement in the Presence of Oligomers through Antiplasticization Effect. 2014 MRS Fall Meeting, November 30-December 5, Boston.

Tilley, A.J., R.D. Pensack, G. Chang, S.T. Lee, B. Djukic, H. Yan, Y. Li, G.D. Scholes, D. S. Seferos (2014). Tuning the Excited State and Semiconducting Properties of Perylene Diimide by Sulfur Atom Substitution. MRS Fall Meeting, November 30-December 5, Boston.

Pouliot, J.R., B. Sun, M. Leduc, A. Najari, Y. Li, M. Leclerc (2014). High Mobility DPP-Based Polymers Obtained by Direct (Hetero)arylation Polymerization. MRS Fall Meeting, November 30-December 5, Boston.

Guo, C., Y. Li (2014). Synthesis of Pyrrolo[3,4-c]pyrrole-1,3-dione Based Polymer Semiconductors and their Application in Organic Thin Film Transistors. 64th Canadian Chemical Engineering Conference, Niagara Falls, ON, October 19-22, 2014.

Sun, B., W. Hong, H. Aziz, Y. Li (2014). Record Electron Mobility for Polymer Semiconductor Thin-film Transistors Based on a New Building Block. 64th Canadian Chemical Engineering Conference, Niagara Falls, ON, October 19-22, 2014.

Sun, B., W. Hong, H. Aziz, Y. Li (2014). Molecular Ordering and Charge Transport Improvement in the Presence of Oligomers through Antiplasticization Effect. 64th Canadian Chemical Engineering Conference, Niagara Falls, ON, October 19-22, 2014.

Li, Y., W. Hong, B. Sun, C. Guo, Z. Yan, S. Chen, Y. He (2014). Semiconducting polymer design for printed electronics. 64th Canadian Chemical Engineering Conference, Niagara Falls, ON, October 19-22, 2014.

Sun, B., W. Hong, H. Aziz, Y. Li (2014). Record High Electron Mobility Polymer Semiconductor for Thin-Film Transistors. 36th Canadian High Polymer Forum, August 5 to 7, 2014, Glen House Resort, Gananoque, ON.

Sun, B., W. Hong, H. Aziz, Y. Li (2014). Diketopyrrolopyrrole-Based Semiconducting Polymer Bearing Thermocleavable Side Chains. 36th Canadian High Polymer Forum, August 5 to 7, 2014, Glen House Resort, Gananoque, ON.

Sun, B., W. Hong, H. Aziz, N.M. Abukhdeir, Y. Li (2014). Improvement of Molecular Ordering and Charge Transport of a DPP-based Polymer in the Presence of Oligomers through Antiplasticization Effect. 36th Canadian High Polymer Forum, August 5 to 7, 2014, Glen House Resort, Gananoque, ON.

Guo, C., B. Sun, J. Quinn, Z. Yan, Y. Li (2014). Synthesis and Properties of Pyrrolo[3,4-c]pyrrole-1,3-dione Based Polymer Semiconductors and Their Performance in Organic Thin Film Transistors. 36th Canadian High Polymer Forum, August 5 to 7, 2014, Glen House Resort, Gananoque, ON.

Guo, C., B. Sun, J. Quinn, Z. Yan, Y. Li (2014). Synthesis and Properties of Indigo Based Donor-Acceptor Conjugated Polymer. 36th Canadian High Polymer Forum, August 5 to 7, 2014, Glen House Resort, Gananoque, ON.

He, Y., Y. Li (2014). A New Solubilizing Side Chain for Large Conjugated Polymers for OTFTs. 36th Canadian High Polymer Forum, August 5 to 7, 2014, Glen House Resort, Gananoque, ON.

Hong, W., C. Guo, Y. Li, Y. Zheng, C. Huang, S. Lu, A. Facchetti (2014). Synthesis and Thin-film Transistor Performance of Benzodipyrrolinone and Bithiophene Donor-Acceptor Copolymers. 36th Canadian High Polymer Forum, August 5 to 7, 2014, Glen House Resort, Gananoque, ON.

Hong, W., C. Guo, Y. Li, Y. Zheng, C. Huang, S. Lu, A. Facchetti (2014). Dipyrrolo[2,3-b:2',3'-e]Pyrazine-2,6(1H,5H)-dione (PzDP) Based Polymers/Molecules for Solution Processed Organic Thin-Film Transistors. 36th Canadian High Polymer Forum, August 5 to 7, 2014, Glen House Resort, Gananoque, ON.

Li, Y., W. Hong, B. Sun, C. Guo, Z. Yan, S. Chen, Y. He, Y. Z. Meng, H. Aziz (2014). Development of Polymer Semiconductors Outperforming Amorphous Silicon for Printed Electronics. The 97th Canadian Chemistry Conference and Exhibition, Vancouver, BC, from June 1 to 5, 2014.

Li, Y. (2014). Printable Organic Semiconductors: The Enabling Materials for Printed Electronics. The 2nd Canadian printed electronics symposium, April 29, 2014, at Xerox Research Centre of Canada, Mississauga.

Li, Y. (2014). High Charge Carrier Mobility Polymer Semiconductors for Thin Film Transistors and Solar Cells. EMN Spring Meeting, February 27-March 2, 2014, Las Vegas.

A. Penlidis

Cummings, S., M.A. Dube, N. Kazemi, A. Penlidis (2014). Reactivity Ratio Estimation: Itaconic Acid/Acrylic Acid Copolymers. 64th CSChE Conf., Niagara Falls, ON, Canada, Oct. 19-22, 2014.

Amintowlieh, Y., C. Tzoganakis, A. Penlidis (2014). Polypropylene Melt Strength Modification by Combining Photoinitiation and Multifunctional Acrylic Monomer. 64th CSChE Conf., Niagara Falls, ON, Canada, Oct. 19-22, 2014.

Sardashti, P., C. Tzoganakis, A. Penlidis (2014). Modification of High Density Polyethylene in a UV-Initiated Reactive Extrusion Process. PPS-30, Cleveland, OH, USA, June 8-12, 2014.

Amintowlieh, Y., C. Tzoganakis, A. Penlidis (2014). Modification of Polypropylene Melt Strength: Effect of Depth and Duration of Radiation. PPS-30, Cleveland, OH, USA, June 8-12, 2014.

Sardashti, A., C. Tzoganakis, A. Penlidis (2014). Reactive Modification of High Density Polyethylene in a UV-Initiated Process. ANTEC 2014, Las Vegas, ND, USA.

Amintowlieh, Y., C. Tzoganakis, S. Hatzikiriakos, A. Penlidis (2014). Modification of Melt Strength of Polypropylene Via UV Radiation. ANTEC 2014, Las Vegas, ND, USA.

M. Tam

Wu X., A. Yu, R.M. Berry, K.M. Tam (2014). Conductive Cellulose Nanocrystals for Next Generation Energy Storage. 64th Canadian Chemical Engineering Conference, Niagara Falls, ON, Canada, October 19-22, 2014.

Tang J.T, Y. Song, W.A. Anderson, R.M. Berry, K.C. Tam (2014). Optimization on Preparing Cellulose Nanocrystals@polyrhodanine. (CNC@PR) Nanoparticles and their Antimicrobial Properties, 64th Canadian Chemical Engineering Conference, Niagara Falls, ON, Canada, October 19-22, 2014.

Quinlan P.J., K.C. Tam (2014). The Removal of a Model Acid Extractable Organic Compound from Oil

Sands Process-affected Water Using Sustainable Nanomaterials Embedded in Macro-gel Beads. 64th Canadian Chemical Engineering Conference, Niagara Falls, ON, Canada, October 19–22, 2014.

Mohammed N, N. Grishkewich, R.M. Berry, K.C. Tam (2014) Adsorption Properties of Cellulose Nanocrystals Incorporated Alginate Hydrogel Beads in Batch and Continuous Adsorption Process. 64th Canadian Chemical Engineering Conference, Niagara Falls, ON, Canada, October 19–22, 2014.

Zhang F., R.M. Berry, K.C. Tam (2014). Synthesis of β -Cyclodextrin-functionalized Cellulose Nanocrystals and their Interactions with Surfactants. 64th Canadian Chemical Engineering Conference, Niagara Falls, ON, Canada, October 19–22, 2014.

Wang H.R., P.H. Ni, K.C. Tam (2014). Synthesis of Polycation Modified Cellulose Nanocrystals and their Application as Gene Vectors. 64th Canadian Chemical Engineering Conference, Niagara Falls, ON, Canada, October 19–22, 2014.

Chen L., R.M. Berry, K.C. Tam (2014). Synthesis of Cyclodextrin-modified Cellulose Nanocrystals(CNCs) @Fe₃O₄@SiO₂ Superparamagnetic Nanorods. 64th Canadian Chemical Engineering Conference, Niagara Falls, ON, Canada, October 19–22, 2014.

Shi Z., J. Tang, C. Yan, S. Tanvir, W.A. Anderson, R.M. Berry, K.C. Tam (2014). Bioinspired Incorporation of Silver Nanoparticles on Cellulose Nanocrystals for Improved Antimicrobial Activity. 64th Canadian Chemical Engineering Conference, Niagara Falls, ON, Canada, October 19–22, 2014.

Chen L., R.M. Berry, K.C. Tam (2014). Synthesis of β -cyclodextrin modified cellulose nanocrystals (CNCs)@Fe₃O₄@SiO₂ superparamagnetic nanorod. 36th annual symposium on polymer science/engineering, Institute of Polymer Research, Waterloo, 21 May 2014.

C. Tzoganakis

Tzoganakis, C., Y. Amintowlieh, A. Penlidis (2014). Long Chain Branching of Polypropylene Through UV-Initiated Reactive Processing. 30th Annual Meeting of the Polymer Processing Society, June 8-12, 2014, Cleveland, OH, USA.

Tzoganakis, C., P. Sardashti, A. Penlidis (2014). Modification of High Density Polyethylene in a UV-Initiated Reactive Extrusion Process. 30th Annual Meeting of the Polymer Processing Society, June 8-12, 2014, Cleveland, OH, USA.

Tzoganakis, C. (2014), Rubber Devulcanization through Extrusion with Supercritical Carbon Dioxide. Continental Tires, Hanover, Germany.

Tzoganakis, C. (2014). Modification of Polyolefins through UV-Initiated Reactive Extrusion. 64th Canadian Chemical Engineering Conference, October 19-22, 2014, Niagara Falls, ON, Canada.

E. Vivaldo-Lima

Vivaldo-Lima, E. (2014) On the Modeling of Reversible Deactivation Radical (Co)Polymerization (RDRP) Processes. Department of Chemical Engineering Seminar Series, Queen's University, Kingston, Ontario, Canada, March 13, 2014.

Vivaldo-Lima, E. (2014). Modeling the Kinetics of Monolith Formation by RAFT Copolymerization of Styrene and Divinylbenzene using a Multifunctional Polymer Molecule Approach.

Vivaldo-Lima, E., López-Domínguez, P. (2014). 3rd Binational Meeting Mexico-USA in Advances in Polymer Science (MACROMEX 2014) and XXVII SPM National Meeting, Riviera Nayarit (Puerto Vallarta

area), Mexico, December 3-6, 2014.

X. Wang

Wang, X. S. (2014). Migration Insertion Polymerization: A New Technique for Main Chain Iron and Phosphorus Containing Polymers. 97th Canadian Chemistry Conference and Exhibition, Vancouver, B.C. 2014, June 1-5.

Kai, C., X. S. Wang (2014). Migratory Insertion Polymerization (MIP) of $\text{CpFe}(\text{CO})_2(\text{CH}_2)_3\text{P}(\text{Ph})_2$: A New Route for the Preparation of Main-chain Metal-containing Polymer. 97th Canadian Chemistry Conference and Exhibition, Vancouver, B.C. 2014, June 1-5.

Murshid, N., X.S. Wang (2014). Synthesis and Self-Assembly of Iron-Phosphine Containing Supramolecular Amphiphiles. 97th Canadian Chemistry Conference and Exhibition, Vancouver, B.C. 2014, June 1-5.

Liu, J., X. S. Wang (2014). Synthesis and Migration Insertion Polymerization (MIP) of $\text{CpFe}(\text{CO})_2(\text{CH}_2)_6\text{PPh}_2$ (FpC6P). 97th Canadian Chemistry Conference and Exhibition, Vancouver, B.C. 2014, June 1-5.

Wang, X. S. (2014). Migratory insertion polymerization (MIP) of $\text{CpFe}(\text{CO})_2(\text{CH}_2)_3\text{P}(\text{Ph})_2$: A new route for the preparation of main-chain metal-containing polymer. 248th ACS National Meeting & Exposition, San Francisco, 2014 August 10-14.

Wang, X.S.(2014). Cellulose Nanowhiskers for Novel Nanocomposite Design. WIN-UB-1 WORKSHOP ON NANOTECHNOLOGY, Quantum-Nano Centre (QNC), University of Waterloo, 2014, 19 May.

Wang, X. S. (2014). Supramolecular Metal-Containing Nanomaterials via Metal Coordination. Organometallic and Polymer Chemistry, Concordia University, 2014, 24 Jan.

B. Zhao

Zhao, B. (2014). Bioinspired Dopamine-Functionalized Polypyrrole Nanofibers and Thin Film Properties. BIT's 4th Annual World Congress of Nano-S&T, Qingdao, China, Oct 29-Oct 31, 2014.

Zhao, B., K. Yang, W. Zhang, A. Cholewinski (2014). Contact Dynamics of Bio-inspired Polydopamine and Its Nanocomposites Thin Films. Surface Forces Apparatus Conference 2014, Cancun, Mexico, Aug 24-29, 2014.

Hahsavan H, N.H. Abukhdeir, B. Zhao (2014). Fabrication and Characterization of Surface Properties of Liquid Crystalline Elastomer Thin Films. 64th Canadian Chemical Engineering Conference, October, 2014.

Pan Z, B. Zhao (2014). Superhydro-oleophobic and Tribological Studies of Fluoro-modified Biomimetic PDMS Micropillars. 64th Canadian Chemical Engineering Conference, October, 2014.

Shahsavan H, J. Quinn J, B. Zhao (2014). Surface Modification of Polydimethylsiloxane by Poly(Acrylic Acid) Brushes through Surface Initiated Atomic Transfer Radical Polymerization. 64th Canadian Chemical Engineering Conference, October, 2014.

Sun S, B. Zhao, Y. Huang (2014). Formation of Silica Colloidal Crystal on Polymeric Surfaces. 64th Canadian Chemical Engineering Conference, October, 2014.

Cholewinski, A.A, K. Yang, B. Zhao B (2014). Alginate-dopamine Hybrid Hydrogel. 64th Canadian

Chemical Engineering Conference, October, 2014.

Zhang W, B. Zhao (2014). Synthesis of Electrically Conductive Polydopamine-polypyrrole nanocomposites. 64th Canadian Chemical Engineering Conference, October, 2014.

Zhao, B. (2014). Biomimetic Adhesion and Its Applications in Functional Materials. Department of Materials Science and Engineering, Tsinghua University, Nov 14, 2014.

Zhao, B. (2014). Biomimetic Adhesion and Its Applications in Functional Materials. Key Laboratory of Green Process and Engineering, Institute of Process Engineering, Chinese Academy of Sciences, Nov 14, 2014.

Zhao, B. (2014). Adhesion, Surface Forces and Micro-mechanical Properties of "Soft" Materials- An Overview. Ha'erbin Institute of Technology (HIT), Nov 18, 2014.

Zhao, B. (2014). Adhesion and Contact Dynamics of "Soft" Materials and Thin Films. 3rd Canada-Brazil Workshop on Sustainable Nanomaterials, Belo Horizonte, Brazil May 26-28, 2014.

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

X. Feng

B. Zhang, P. Sampranpi boon, X. Feng, (2015). Pervaporative extraction of dairy aroma compounds in: Membrane Separations for Dairy Streams and Ingredients, K. Hu, J. Dickson (Eds.), Chapter 7, John Wiley and Sons.

M. Gauthier

Lamboni, L.; Gauthier, M.; Yang, G. Silk Sericin: Applications to Tissue Engineering and Drug Delivery. Submitted to *Journal of Tissue Engineering and Regenerative Medicine*

Y. Li

US Provisional Appl. No. 62059894 Li, Y.; Sun, B. (2014). N-type organic semiconductor formulations and devices.

US Provisional Appl. No. 62059894 Li, Y.; Sun, B. (2014). N-type organic semiconductor formulations and devices.

US Provisional Appl. No. 62012263 Li, Y. (2014). Large Heterocyclic Organic Semiconductors and Devices.

US Provisional Appl. No. 62006266, Li, Y. (2014). Heterocyclic Monomeric, Oligomeric and Polymeric Semiconductors and Devices.

US 20120157689 Li, Y. (2014). Compound Having Indolocarbazole Moiety and Divalent Linkage.

US20140088313 Wu, Y.; Ong, B. S.; Qi, Y.; Li, Y. (2014). Substituted Indolocarbazoles.

US Provisional Appl. No. 61944532 Li, Y.; Hong, W. (2014). Polycyclic Ring Structure Based Monomeric, Oligomeric and Polymeric Semiconductors and Devices.

A. Penlidis

Amintowlieh, Y., C. Tzoganakis and A. Penlidis (2014). Polypropylene with improved strain hardening characteristics and long chain branching with UV irradiation. May 2013; 61/854,188 US provisional patent application. Refiled in April 2014 as 61/995,627 USPTO.

M. Tam

Polydopamine Functionalized Cellulose Nanocrystals and Uses Thereof [Patent Application No. 62/027,319, July 22, 2014]

Pristine and Surface Functionalized Cellulose Nanocrystals (CNCs) Incorporated Hydrogel Beads and Uses Thereof [Patent Application No. 62/095,366, Dec 22, 2014]

E. Vivaldo-Lima

A positive book review for “*Handbook of Polymer Synthesis, Characterization and Processing*, Edited by Enrique Saldívar-Guerra and Eduardo Vivaldo-Lima” (2013) was provided in *Angewandte Chemie* (Annette Schmidt, *Angewandte Chemie International Edition*, Volume 53, Issue 2, page 358, January 7, 2014, DOI: 10.1002/anie.201309282). The review concludes that “*Handbook of Polymer Synthesis, Characterization and Processing* is a valuable reference work for everyone working in the area of polymer science and technology, and for advanced students who wish to get a good insight into specific aspects of this field”.

B. Zhao

Boxin Zhao, Wei Zhang, Fut (Kuo) Yang (2014). “Fabrication, Composition and Application of Electrically Conductive Catechol-Polypyrrole Nanofibers”, Provisional US Patent Application # 62/054,192.

15. OTHER HIGHLIGHTS FOR YEAR 2014

Prof Penlidis was a consultant with 7 companies (Canada, USA, Europe).

Prof Penlidis was an Editorial Board Member for *J. Macromol. Sci.-Pure and Appl. Chem.*, *Polymer-Plastics Techn. and Eng.*, and *Macromol. React. Eng.* (considerable work as editorial board member promoting or guest-editing special issues, organizing surveys and adjudicating for editor).

Prof Penlidis continued his international academic collaborations (regular basis with co-authored articles) with the following universities: UNAM (Mexico), Los Andes (Venezuela), Manipal (Karnataka, India), and (more locally), Toronto, Ottawa, Ryerson Polytechnic and McGill.

Prof Penlidis acted as organizer/co-chair of a session in the 9th PRE conference (the most prestigious in the area of Polymer Reaction Engineering, held once every 3 years), and had many interactions with the organizing scientific committee and conference co-chairs; conference to be held in May 2015 in Cancun, Mexico.

Prof. Tzoganakis’ startup company, Tyromer Inc., was named one of the [2014 TiE50 winners](#) – a prestigious [TiE Silicon Valley](#) honour awarded to only 50 companies among thousands competing worldwide. TiE50 is TiE Silicon Valley’s premier annual awards program contested by thousands of technology startups worldwide. Since the awards inception, TiE reports that 94 per cent of the winners

and finalists have been funded, attracting billions of dollars in investments. The TiE50 award recognition significantly raises the company's profile as a socially responsible and ecologically sustainable investment opportunity, which the company hopes will lead to a near-term financing deal.

Prof. Boxin Zhao was featured on the University of Waterloo website citing "Waterloo researcher is developing nano-glue for electronics" on Sept 16, 2013.

<https://uwaterloo.ca/stories/waterloo-researcher-developing-nano-glue-electronics>

E. Vivaldo-Lima continues to participate as Member of the Editorial Board of Journal of Macromolecular Science, Part A: Pure & Applied Chemistry (Taylor & Francis).

E. Vivaldo-Lima started a sabbatical leave from UNAM as Visiting Professor at the Department of Chemical & Biological Engineering of the University of Ottawa, carrying out research collaboration with Professor Marc A. Dubé. The research leave goes from August 2013 to July 2014.

E. Vivaldo-Lima concluded his participation as a Member for UNAM in the Scientific Committee and technical coordinator for the UNAM team, in Project "BABETHANOL" (www.babethanol.com), funded by the European Community's Seventh Framework Programme (FP7/2007-2013) under grant agreement n° 227498. The Project concluded satisfactorily in May 2013.

Boxin Zhao co-organized the Session "Macromolecular Science and Complex Fluids", 64th Canadian Chemical Engineering Conference, Niagara Falls, ON, October 19-22, 2014.

Boxin Zhao co-chaired the session "Polymer Nanotechnology", BIT's 4th Annual World Congress of Nano Science & Technology, Qingdao, China Oct 28-Nov 1, 2014.

INSTITUTE FOR POLYMER RESEARCH
CELEBRATING 30 YEARS OF OFFICIAL INSTITUTE STATUS
 THIRTY-SIXTH ANNUAL SYMPOSIUM
ON POLYMER SCIENCE/ENGINEERING 2014
Conrad Grebel College
Great Hall
University of Waterloo, Waterloo, Ontario
Wednesday, May 21, 2014

8:30 a.m.	Coffee
8:50	Welcome and Opening Remarks
9:00 - 9:20	Hamed Shahsavan Fabrication and Characterization of Bioinspired Functionally Graded Adhesive Materials (Winner of the 2013 IPR Award for Academic Excellence in Polymer Science/Engineering)
9:20 - 10:00	Industry Speaker: Dr. Guerino Sacripante, XRCC Novel Sustainable Polymers from Natural Phenols and Rosin Acids
10:00 – 10:30	<u>5-Min. Mini Presentations</u> 1) Dina Hamad Experimental Study of Polyvinyl Alcohol Degradation in Aqueous Solution by UV/ H ₂ O ₂ Process 2) Ryan Amos Hydrophobic Modification of Starch Nanoparticles 3) Remi Casier Using Visible Light to Probe Interparticle Diffusion in Latex Films 4) Li Chen Synthesis of β -cyclodextrin modified cellulose nanocrystals (CNCs)@Fe ₃ O ₄ @SiO ₂ superparamagnetic nanorods 5) Wei Yi Probing Hydrophobically Modified Starch Nanoparticles by Pyrene Fluorescence and Transmission Electron Microscopy 6) Yifeng Huang Polyvinylamine-enhanced Ultrafiltration for Removal of Heavy Metals from Wastewater
10:30 - 10:50	Coffee
10:50 - 11:10	Mike Fowler Temperature Response of Aqueous Solutions of a Series of Pyrene End-Labeled Poly(N-isopropylacrylamide)s Probed by Fluorescence
11:10 – 11:30	Jin Liu Synthesis and Migration Insertion Polymerization (MIP) of CpFe(CO) ₂ (CH ₂) ₆ PPh ₂ (FpC ₆ P)

11:30 – 12:00

5-Min. Mini Presentations

- 7) **Shiva Farhangi**
A 4-Atom Linker to Label Macromolecules with a Pyrene Derivative that Responds to Local Polarity
- 8) **Ankita Saikia**
Modelling the vulcanization reaction of devulcanized rubber
- 9) **Nicholas Lanigan**
A Novel Metal-Containing Supramolecular Polymer
- 10) **Alice Yang**
Preparation and Characterization of Temperature-Responsive Polymeric Surfactants
- 11) **Marzieh Riahinezhad**
Some special factors influencing copolymerization kinetics of a polyelectrolyte system
- 12) **Solmaz Pirouz**
Using Pyrene Fluorescence to Probe the Behaviour of Semicrystalline Polyolefins in Solution

12:00 - 1:00

Lunch

1:00 - 1:40

Academic Speaker: **Prof. Harald Stöver, McMaster University**
Fundamental Chemists in Pursuit of Biomedical Polymers

1:40 – 2:00

Yasaman Amintowlieh
Is it possible to increase polypropylene melt strength via UV radiation?

2:00 – 2:20

Kai Cao
Migratory insertion polymerization (MIP) of $\text{CpFe}(\text{CO})_2(\text{CH}_2)_3\text{P}(\text{Ph})_2$: A new route for the preparation of main-chain metal-containing polymer

2:20 - 2:40

Niousha Kazemi
Do binary monomer reactivity ratios apply to terpolymerizations as well?

2:40 - 3:00

Bin Sun, Chemical Engineering, Waterloo
High performance polymer semiconductors for thin-film transistors
(Winner of 2013 IPR Award for Academic Excellence in Polymer Science/Engineering)

3:00 - 3:20

Coffee

3:20 - 3:40

Mylène Le Borgne
Solution-processable oligomer semiconductors for organic solar cells

3:40 - 4:00

Dihua Wu
Thin Film Composite Nanofiltration Membranes Formed by Interfacial Polymerization

4:00 - 4:20

Lu Li
Characterization of Structure and Dynamics of Starch Nanoparticles by Fluorescence

4:20 – 4:40

Boya Zhang
Dairy flavor recovery by pervaporation using poly(ether block amide) membrane

4:40 – 5:00

Olivier Nguon
Microplasma-OES for Metal Concentration Determination: Application to Nanocatalysis

5:00

Closing remark

6:00 - 7:30

IPR Industrial Member DINNER
University Club, Main Dining Room

7:30 - 9:00

Poster Presentations and Informal Get-together
University Club, Main Dining Room
(IPR graduate students/researchers and symposium participants)

Poster presentations follow on next page

INSTITUTE FOR POLYMER RESEARCH
 THIRTY-SIXTH ANNUAL SYMPOSIUM
 ON POLYMER SCIENCE/ENGINEERING 2014
 POSTER SESSION
 WEDNESDAY, MAY 21, 2014
UNIVERSITY CLUB
7:30 – 9:00 pm

Yasaman Amintowlieh Chem. Eng., Waterloo	Photoinitiator-induced modification of polypropylene: the effect of acrylic co-agent
Remi Casier Chemistry, Waterloo	Using Visible Light to Probe Interparticle Diffusion in Latex Films
Shiva Farhangi Chemistry, Waterloo	Effect of Side Chain Length on the Internal Dynamics of Polymethacrylates in Solution
Mike Fowler Chemistry, Waterloo	Temperature Response of Aqueous Solutions of a Series of Pyrene End-Labeled Poly(N-isopropylacrylamide)s Probed by Fluorescence
Chang Guo Chem. Eng., Waterloo	Synthesis and properties of indigo based donor-acceptor conjugated polymers
Niousha Kazemi Chem. Eng., Waterloo	Case studies with the optimal estimation of reactivity ratios in terpolymerization
Mylène Le Borgne Chem. Eng., Waterloo	Solution-processable oligomer semiconductors for organic solar cells
Solmaz Pirouz Chemistry, Waterloo	A Novel Method to Determine the Chemical Composition of Polyisobutylene-Based Oil-Soluble Dispersants by Fluorescence
Marzieh Riahinezhad Chem. Eng., Waterloo	Reactivity ratios in polyelectrolyte copolymerizations: Does ionic strength play a role?
Ankita Saikia Chem. Eng., Waterloo	Modelling the vulcanization reaction of devulcanized rubber
Kate Stewart Chem. Eng., Waterloo	Doped Polyaniline for the Detection of Ethanol
Alice Yang Chemistry, Waterloo	Preparation and Characterization of Temperature-Responsive Polymeric Surfactant
Wei Yi Chemistry, Waterloo	Probing Hydrophobically Modified Starch Nanoparticles by Pyrene Fluorescence and Transmission Electronic Microscope

**THIRTY-SIXTH ANNUAL SYMPOSIUM
ON POLYMER SCIENCE/ENGINEERING
May 21, 2014--CONRAD GREBEL COLLEGE**

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**THIRTY-SIXTH ANNUAL SYMPOSIUM
ON POLYMER SCIENCE/ENGINEERING
May 21, 2014--CONRAD GREBEL COLLEGE**

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PREPRINTS 2014

- 14-001 **Modeling of the Production of Hydrogels from Hydroxyethyl Methacrylate (HEMA) and (Di)Ethylene Glycol Dimethacrylate (EGDMA or DEGDMA) in the Presence of RAFT Agents**
L. Espinosa-Pérez, J.C. Hernández-Ortiz, P. López-Domínguez, G. Jaramillo-Soto, E. Vivaldo-Lima, P. Pérez-Salina, A. Rosas-Aburto, A. Licea-Claverie, H. Vázquez-Torres, M.J. Bernad-Bernad.
Macromolecular Reaction Engineering, Acc., 01/14
- 14-002 **Synthesis of Arborescent Polystyrene-*g*-[Poly(2-vinylpyridine)-*b*-Polystyrene] Core–Shell–Corona Copolymers**
J. Dockendorff, M. Gauthier
J. Polym. Sci., Part A: Polym. Chem., Acc., 01/14
- 14-003 **Synthesis, Cyclization, and Migration Insertion Oligomerization of $\text{CpFe}(\text{CO})_2(\text{CH}_2)_3\text{PPh}_2$ in Solution**
K. Cao, B. Tsang, Y. Liu, D. Chelladural, W.P. Power, X. Wang
Organometallics, Acc., 01/14
- 14-004 **Determination of the loading and stability of Pd in an arborescent copolymer in ethanol by microplasma-optical emission spectrometry**
O. Nguon, M. Gauthier, V. Karanassios
RSC Advances, Acc. 01/14
- 14-005 **Reactivity Ratio Estimation in Radical Copolymerization: From Preliminary Estimates to Optimal Design of Experiments**
N. Kazemi, B.H. Lessard, M. Marić, T.A. Duever, A. Penlidis
Ind. & Eng. Chem. Res., Acc. 02/14
- 14-006 **Depletion gels from dense soft colloids: rheology and thermoreversible melting**
D. Truzzolillo, D. Vlassopoulos, A. Munam, M. Gauthier
J. of Rheology, Acc. 02/14
- 14-007 **Mechanical Properties of ETFE Foils: Testing and Modelling**
L. Charbonneau, M.A. Polak, A. Penlidis
Constr. & Build. Mat., Acc. 02/14
- 14-008 **Demystifying the Estimation of Reactivity Ratios for Terpolymerization Systems**
N. Kazemi, T.A. Duever, A. Penlidis
AIChE Journal, Acc. 03/14
- 14-009 **Effects of Processing Variables On Polypropylene Degradation and Long Chain Branching with UV Irradiation**
Y. Amintowlieh, C. Tzoganakis, S.G. Hatzikiriakos, A. Penlidis
Polymer Degradation and Stability, Acc. 03/14

- 14-010 **Branched and Crosslinked Polymers Synthesized through NMRP: Quantitative Indicators for Network Homogeneity?**
A.J. Scott, A. Nabifar, A. Penlidis
Macromol. React. Eng., Acc. 03/14
- 14-011 **Modeling of Network Formation in the Atom Transfer Radical Co-polymerization (ATRP) of Vinyl/Divinyl Monomers Using a Multifunctional Polymer Molecule Approach**
J.C. Hernández-Ortiz, E. Vivaldo-Lima, M.A. Dubé, A. Penlidis
Macromol. Theory and Simulations, Acc. 03/14
- 14-012 **Record High Electron Mobility of $6.3 \text{ cm}^2 \text{ V}^{-1} \text{ s}^{-1}$ Achieved for Polymer Semiconductors Using a New Building Block**
B. Sun, W. Hong, Z. Yan, H. Aziz, Y. Li
Advanced Materials, Acc. 03/14
- 14-013 **Characterization of the Chemical Composition of Polyisobutylene-Based Oil-Soluble Dispersants by Fluorescence**
S. Pirouz, Y. Wang, J.M. Chong, J. Duhamel
J. Phys. Chem. B., Acc. 03/14
- 14-014 **A new lignocellulosic biomass deconstruction process combining thermo-mechano chemical action and bio-catalytic enzymatic hydrolysis in a twin-screw extruder**
V. Vandebossche, J. Brault, G. Vilarem, O. Hernández-Meléndez, E. Vivaldo-Lima, M. Hernández-Luna, E. Barzana, A. Duque, P. Manzanares, M. Ballesteros, J. Mata, E. Castellón, L. Rigal
Industrial Crops and Products, Acc. 02/14
- 14-015 **Fluorescence Resonance Energy Transfer in Partially- and Fully-Labelled Pyrene Dendronized Porphyrins Studied with the Model Free Analysis**
G. Zaragoza-Galán, M. Fowler, R. Rein, N. Solladié, J. Duhamel, E. Rivera
J. Phys. Chem. C., Acc. 03/14
- 14-016 **Effect of Ionic Strength on the Reactivity Ratios of Acrylamide/Acrylic Acid (Sodium Acrylate) Copolymerization**
M. Riahi-zhad, N. Kazemi, N. McManus, A. Penlidis
J. Appl. Polym. Sci., Acc. 05/14
- 14-017 **The Effect of Depth and Duration of UV Radiation on Polypropylene Modification Via Photoinitiation**
Y. Amintowlieh, C. Tzoganakis, A. Penlidis
J. Appl. Polym. Sci., Acc. 05/14.

- 14-018 **Modeling the Kinetics of Monolith Formation by RAFT Copolymerization of Styrene and Divinylbenzene**
P. López-Domínguez, J.C. Hernández-Ortiz, K.J. Barlow, E. Vivaldo-Lima, G. Moad
Macromolecular Reaction Engineering., Acc. 05/14
- 14-019 **Role of Contact Electrification and Electrostatic Interactions in Gecko Adhesion**
H. Izadi, K.M.E. Stewart, A. Penlidis
J. Roy Soc Interface, Acc. 06/14
- 14-020 **Rheological Indicators for Environmental Stress Cracking Resistance of Polyethylene**
P. Sarashti, C. Tzoganakis, M. Zatloukal, M. Polak, A. Penlidis
Intern. Polym.Proc., Acc 08/14
- 14-021 **Bayesian Design of Experiments Applied to a Complex Polymerization System: Nitrile Butadiene Rubber Production in a Train of CSTRs**
A. Scott, A. Nabifar, C.M.R. Madhuranthakam, A. Penlidis
Macromol. Theory and Simul., Acc. 09/14
- 14-022 **Interactions between a Series of Pyrene End-Labeled Poly(ethylene oxide)s and Sodium Dodecyl Sulfate in Aqueous Solution Probed by Fluorescence**
S. Chen, J. Duhamel, B. Peng, M. Zaman, K.C. Tam
Langmuir, Acc. 10/14
- 14-023 **Preparation and Characterization of Long Chain Branched Polypropylene Through UV Irradiation and Coagent Use**
Y. Amintowlieh, C.Tzoganakis, and A. Penlidis
Polymer-Plastics Technology and Engineering, Acc. 11/14
- 14-024 **Design of Optimal Experiments for Terpolymerization Reactivity Ratio Estimation**
N.Kazemi, T. Deuver, and A. Penlidis
Macromol, React Eng., Acc 12/14
- 14-025 **Effect of Monomer Concentration and pH on Reaction Kinetics and Copolymer Microstructure of Acrylamide/Acrylic Acid Copolymer**
M. Riahinezhad, N. McManus, and A. Penlidis
Macromolecular Reaction Engineering., Acc 12/14

APPENDIX 4

Research Personnel (SUPERVISOR)

NAME	CAT	DEPT	TD	JD	RD	XF	MG	YL	NMc	AP	MT	CT	XW	BZ	THESIS/PROJECT TOPIC	COMPL. DATE
S.. Akhlaghi	2	ChE									X				Surface Modication and Characterization of Cellulose Nanocrystals For Biomedical Applications	Apr 14
P. Arczewska	2	CivE								X					Polymeric fibre-reinforced bars (co-supervised with Prof MA Polak)	Dec 16
M. Alsehli	2	Chem					X								Arborescent polypeptide micelles (Saudi Arabia Scholarship)	Aug 15
A. Alturk	2	Chem					X								Arborescent Polybutadiene Synthesis and Rheology	Aug 18
Y. Amintowlieh	2	ChE								X		X			Long-chanin branching of polypropylene	Mar 12
Y. Amintowlieh	3	ChE								X					Rheology and Kinetics of water-soluble polymers	Dec 14
B.M. Amoli	2	ChE												X	Functionalization and dispersion of silver nanofillers (co-supervised with N. Zhou in MME)	Dec 14
R. Amos	2	Chem					X								Hydrophobic Modification of Starch Nanoparticles	Aug 17
M. Ahsan	2	ChE				X									Gas separation by membranes	Aug 14
K. Cao	2	Chem											X		Exploring migration insertion polymerization for main chain metal containing polymers	May 15
R. Casier	1	Chem		X			X								Visible Light Emission to Probe Inter-Particle Diffusion in Latex Films	Apr 15
S. Chen	2	Chem		X											Characterization of solutions of pyrene end-labelled poly(ethylene oxide) by fluorescence and Rheology	May 14
L. DaPeng	2	Chem											X		Self-assembly of PFpP for functional nanomaterials	Sep 18
S. Farhangi	2	Chem		X											Characterizing polymer chain dynamics in solution of various polymeric backbones by pyrene excimer formation by pyrene excimer formation	Apr 16
M. Farooq	2	ChE				X									Waste water treatment by membrane/adsorption	Jan 14
J. Fernandez	2	Chem					X								Grafting of Starch Nanoparticles	Aug 18
A.. Gao	1	ChE				X									Pervaporation for MEOH/DMC separation	Aug 14
M. Guan	1	ChE				X									Waste water treatment by adsorption and membranes	Apr 14
C. Guo	2	ChE						X							High Performance polymer semiconductors for organic electronics	Sep 15
M. Hazlett	2	ChE								X					Sensor selection studies in controlled radical polymerization	Sep 12
Y. He	2	ChE						X							New polymer semiconductors for printed electronics	Sep 17

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W. Hong	4	ChE						X							Polymer semiconductors	Nov 14
Y. Hu	2	ChE				X									Facilitated transport membranes	Apr 14
Y. Huang	2	ChE				X									Micelle-enhanced ultrafiltration	Aug 15
H. Izadi	2	ChE								X					Polymers with tailor-made adhesive properties at nano-scale	Feb 14
H. Izadi	3	ChE								X					As Above	June 14
N. Kazemi	2	ChE								X					Parameter estimation in terpolymerization	Nov 14
D. Kim	1	Chem		X											Characterization of Modified Starch Nanoparticles by Fluorescence	Aug 16
S. Lai	2	ChE				X									Heavy metal removal from waste water	Aug 16
N. Lanigan	2	Chem											X		Supramolecular polymerization of organometallic monomers	Dec 17
M. Le Borgne	2	ChE						X							Photovoltaic solar cells based on low-molecular weight solution processable organic semiconductors:from material design to efficient devices	Sep 16
C. Legros	2	ChE									X				Engineering of Poly(2-oxazoline)s for a potential use in biomedical applications	Oct 14
L. Li	2	Chem		X											Intrinsic Properties of Starch Nanoparticles Probed by Pyrene Excimer Fluorescence	Aug 16
X. Li	1	ChE						X							Optimization of conductive ink formulations for inject printing of circuits	Apr 15
J. Liu	2	Chem											X		Synthesis and characterization of PFpP using migration insertion polymerization	Sep 15
A. Maneshi	4	ChE										X			Flow additives for polypropylene	Apr 14
T. Matsumura	4	ChE										X			Extrusion of UHMWPE with scCO2	Aug 14
M. Meysami	3	ChE										X			Rubber devulcanization with scCO2	Dec 14
N. Mohammed	2	ChE									X				Cellulose nanocrystals for water treatment	Sep 17
N. Murshid	2	Chem											X		Creating functional nanomaterials using organometallic building blocks	Sep 15
P. Mutyala	3	ChE										X			TPV Production From Devulcanized Rubber	Jan 16
A. Nabifar	2	ChE								X					Bayesian design of experiments in emulsion and controlled radical polymerization	Sept. 12
L.Y. Nan	2	ChE									X				Nanoparticle synthesis using polyacrylic acids	Apr 14
M. Neqal	2	Chem					X								Smart Polymeric Nanomaterials by Encapsulation	Sep 17
S. Nie	1	ChE										X			Study Of Die Drool Of Controlled-Rheology Polypropylene Resins	Sep 15
O. Nguon	2	Chem					X								Polymer-Stabilized Metallic Nanoparticle Catalysts	Jan 15

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Z. Pan	2	ChE												X	Development of low friction and oleophobic coating materials	Sep 16
A. Peivandi	2	Chem		X											First Dyanmic Map of a Folding Protein Obtained by Pyrene Excimer Fluorescence	Aug 18
B.L. Peng	2	ChE									X				Interactions between functionalized biocompatible polymer systems and surfactants	Sep 14
S. Pirouz	2	Chem		X											Characterization of Modified PIBSA-Based Dispersants	Aug 15
B. Qiu	1	ChE				X									Waste water treatment by absorption	Aug 16
J. Quinn	2	ChE						X							N-type polymer semiconductors for printed electronics	Sep 17
M. Rahman	2	Chem											X		Synthesis and characterization of non-iron metal-carbonyls	Sep 18
M. Reza	2	ChE				X									Membrane bioreactor for wastewater treatment	Aug 16
M. Riahinezhad	2	ChE							X	X					Copolymerization kinetics of acrylic acid and acrylamide for enhanced oil-recovery applications	Sep 15
A. Saikia	4	ChE										X			Evaluation Of Devulcanized Rubber Properties	Jan 16
A. Sardashti	2	ChE								X		X			Evaluation and Modification of Properties of Polyethylene Resins	Feb 14
A.J. Scott	1	ChE								X					Water-soluble co- and ter-polymerizations	Aug 15
H. Sepiani	2	CivE								X					Finite element analysis of polymeric fibre-reinforced bars (co-supervised with Prof MA Polak)	Dec 16
Z. Shi	3	ChE									X				Functionalization of cellulose nan crystals	
N. Singh	1	Chem											X		Functionalization of CpCOFeCOMe for metal containing polymers	May 14
K. Stewart	2	ChE								X					Polymeric sensors for detection of toxic analytes	May 16
B. Sun	2	ChE						X							Donor-accepter polymers for printed electronics	Apr 16
J. Sun	2	ChE				X									Polyelectrolyte membranes	Aug 15
J. Tang	2	ChE									X				Cellulose nanocrystals for Pickering emulsion	Sep 17
D. Vishnu	3	Chem					X								Butyl rubber carboxylated ionomers by "click"	Mar 15
A. Vo Thu Nguyen	2	Chem					X								Magnetic micelles as therapy and diagnostic (theranostic) agents	Sep 15
X. Wang	4	ChE				X									Oil separation by membranes	Dec 15
A.Worku	2	Chem					X								Arborescent Micelles from Polyelectrolyte Complexes	Aug 17
D. Wu	2	ChE				X									Nanofiltration membranes	Apr 15

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K. Wu	1	ChE				X									Nitrogen removal from natural gas by membranes	Apr 15
X. Wu	2	ChE									X				Conductive cellulose nanocrystals	Sep 16
X. Xu	2	ChE				X									Surface modification of membranes	Dec 15
Y. Yang	2	ChE						X							Electrochemically grown nanostructured metal oxide semiconductors for hybrid solar cells	Apr 16
B. Zhang	2	ChE				X									Aroma compound recovery from aqueous solutions	Aug 16
J. Zhang	4	ChE				X									Waste water treatment nanofiltration	Aug 15
W. Zhang	2	ChE												X	Surface and tribological behaviour of Mussel-inspired polydopamine thin films	Sep 16
Y. Zhang	2	ChE				X									Solvent dehydration by pervaporation	Apr 14
N. Zhou	1	Chem											X		Metal carbonyl block copolymers	Sep 16

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