

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

NEWSLETTER 2008

1. IPR SENATE RENEWAL

We will start this year's newsletter by repeating the first item of last year's newsletter, given that it might be of interest to new readers and a "refresher" to others. The Senate Research Council (of the Senate) of the University of Waterloo (UW) reviews all UW senate-approved institutes every five years. IPR was reviewed in October, 2005 and received approval with accolades. The next review will take place in the fall of 2010.

A brief excerpt from the 2005 five-year review report is cited below:

Special Thanks

Professor Penlidis and all IPR members (and students) would like to thank the IPR Administrative Coordinator, Rosemary Anderson, for continuous, exemplary service since 1986. Rosemary's contributions to the IPR "day-to-day life" are simply outstanding.

Plan for the Next Five-Year Period

Some new initiatives in the next two years will include the selection of an Associate Director for IPR to work with Professor Penlidis in 2008-2010 for future continuity. Professor Penlidis will be stepping down as Director in 2010.

2. ANNUAL IPR SYMPOSIUM

The 31st Annual IPR Symposium will be held May 1, 2009. A schedule and registration forms have been circulated electronically, as usual.

Many thanks to all who participated in the 2008 Symposium (an audience of about 60 people)—IPR received very positive feedback regarding the topics covered. A list of industrial participants and the 2008 program 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 2008, the IPR office sent out 23 preprints to our members (Appendix 3).

5. RESEARCH PROGRAMS

We have more than 60 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

R. Dhib

MASc ChE, Ryerson University
Md Zia-UL Islam Modeling of infrared drying of polymer solutions

J. Duhamel

Ph.D. Chem Ingratta, M. Aspects of Polymer Chain Dynamics in Solution Studied by Fluorescence

X. Feng

PhD ChE Mujiburohman, M. Aroma compound recovery from aqueous solutions by pervaporation

PhD ChE Liu, L. Gas separation by poly(ether block amide) membranes

PhD ChE Du, R. Studies on poly(N,N-dimethyl aminoethyl methacrylate) membranes for gas separation and pervaporation

M. Gauthier

Ph.D. Chem Munam, A. Graft Polymers: From Dendrimer Hybrids to Latex Particles

A. Penlidis

MASc ChE Jung, W. Modeling of multicomponent (6-monomer) industrial reactor (with T.A. Duever)

Washington, I. Modeling of nitrile rubber emulsion polymerization reactors (with T.A. Duever)

PhD ChE Cheng, J. Relating ESCR to microstructural properties of HDPE for pipes

J.B.P. Soares

MASc ChE Al-Shaiban, A. Propylene polymerization with Ziegler-Natta catalysts

C. Tzoganakis

MASc ChE Ancheh, V.N. A Study of Polycarbonate/Polybutylene terephthalate Compounding in a Twin Screw Extruder (with T.A. Duever)

E. Vivaldo-Lima

M. Eng. ChE-UNAM (Mexico)
Hernandez-Ortíz, J.C. Modeling of vinyl/divinyl copolymerization in the presence of NMRP controllers

PhD ChE-UNAM (Mexico)
Roa-Luna, M. Evaluation of the importance of diffusion-controlled-effects in the NMRP of styrene using TEMPO and BPO

PhD	ChE-CIQA (Mexico) Soriano-Moro, A.G	Synthesis and characterization of dithiolactones, and their use as transfer agents for RAFT polymerization (with Dr. Ramiro Guerrero-Santos)
PhD	ChE-UNAM (Mexico) Quintero-Ortega, I.A.	Modeling and simulation of homo- and copolymerization processes in supercritical carbon dioxide).

7. ACADEMIC MEMBERS OF THE INSTITUTE FOR POLYMER RESEARCH

Professors:

- R. Dhib
- T.A. Duever
- J. Duhamel
- X. Feng
- M. Gauthier
- N. McManus
- A. Penlidis, Director
- L. C. Simon
- J.B.P. Soares
- P. Sullivan
- C. Tzoganakis
- E. Vivaldo-Lima

Please see brief description of research interests and projects, along with contact information, by visiting the following web link:

<http://www.ipruw.com/contact/faculty-ria.htm>

8. MEMBER COMPANIES

Currently we have **17 member companies**: (refer also Appendix 2)

- Andercol S.A.
- AT Plastics Inc.
- BASF AG/Corporation
- Borealis AS
- Braskem, Brazil
- Canadian General Tower
- CID/DESC, Centro de Investigación Desarrollo Tecnológico, Mexico
- CIQA, Saltillo, Mexico
- Compuplast Canada Inc.
- The Dow Chemical Company
- Lanxess Inc.
- OMNOVA Solutions Inc.
- PolyVation, The Netherlands
- Princeton Polymer Consultants
- SABIC EuroPetrochemicals
- Sumitomo Chemical Co., Japan
- Sunoco Inc.

9. STUDENT AWARDS

A. Penlidis

Joy Cheng, NSERC scholar
Afsaneh Nabifar, NSERC scholar

J.B.P. Soares

Y. Choi, WIN Graduate Scholarship

10. FACULTY AWARDS

J. Duhamel

Tier-2 Canada Research Chair

A. Penlidis

Tier 1 Canada Research Chair (2002-2008; 2009-2015)

11. FULL REFEREED JOURNAL PAPERS

R. Dhib

Khazraei P.F., and R. Dhib (2008). Modeling of Ethylene Polymerization with Difunctional Initiators in Tubular Reactors. *Journal of Applied Polymer Science*, V109 (6), 3908 – 3922.

Edalatmanesh M., M. Mehrvar and R. Dhib (2008). Optimization of phenol degradation in a combined photochemical–biological wastewater treatment system. *Chemical Engineering Research and Design*, 86 (11), pp. 1243-1252.

J. Duhamel

Ingratta, M.; Duhamel, J. (2008). Effect of Side-chain Length on the Side-chain Dynamics of Helical Poly(L-glutamic acid) as Probed by a Fluorescence Blob Model. *J. Phys. Chem. B*, 112, 9209-9218.

Ingratta, M.; Hollinger, J.; Duhamel, J. (2008). A Case for Using Randomly Labeled Polymers to Study Long Range Polymer Chain Dynamics by Fluorescence. *J. Am. Chem. Soc.*, 130, 9420-9428.

Shen, Y.; Duhamel, J. (2008). Micellization and Adsorption of a Series of Succinimide Dispersants. *Langmuir*, 24, 10665-10673.

Zhang, M.; Duhamel, J. (2008). Study of maleated ethylene-propylene copolymers by fluorescence: Evidence for succinimide induced polar associations in an apolar solvent. *Eur. Polym. J.*, 44, 3005-3014.

Siu, H.; Duhamel, J. (2008). Molar Extinction Coefficient of Pyrene Aggregates in Water. *J. Phys. Chem. B*, 112, 15301-15312.

X. Feng

J.R. Du, A. Chakma and X. Feng (2008), Dehydration of ethylene glycol by pervaporation using poly(N,N-dimethylaminoethyl methacrylate)/polysulfone composite membranes, *Separation and Purification Technology*, 64, 63-70.

E.A. Fouad and X. Feng (2008). Use of pervaporation to separate butanol from dilute aqueous solutions: Effects of operating conditions and concentration polarization *Journal of Membrane Science*, *Journal of Membrane Science*, 323, 428-435.

S. Xiao, R.Y.M. Huang and X. Feng (2008). 2,2-Bis[4-(3,4-dicarboxyphenoxy) phenyl] dianhydride (BPADA)-based polyimide membranes for pervaporation dehydration of isopropanol: Characterization and comparison with 4,4'-(hexafluoroisopropylidene) diphthalic anhydride (6FDA)-based polyimide membranes, *Journal of Applied Polymer Science*, 110, 283-296.

S. Xiao, X. Feng and R.Y.M. Huang (2008). Synthetic 6FDA-ODA copolyimide membranes for gas separation and pervaporation: Correlation of separation properties with diamine monomers, *Polymer Engineering and Science*, 48, 795-805.

L. Liu, A. Chakma and X. Feng (2008). Gas permeation through water-swollen hydrogel membranes, *Journal of Membrane Science*, 310, 66-75.

M. Gauthier

Ramirez, I.; Cherney, E. A.; Jayaram, S.; Gauthier, M. (2008). Surfactants in the Preparation of Nanofilled Silicone Dielectrics for Outdoor Insulation Applications. *IEEE Trans. Dielectr. Electr. Insul.*, 15, 228-235.

Il Yun, S.; Lai, K.-C.; Briber, R. M.; Teertstra, S. J.; Gauthier, M.; Bauer, B. J. (2008). Conformation of Arborescent Polymers in Solution by Small-Angle Neutron Scattering: Segment Density and Core-Shell Morphology. *Macromolecules*, 41, 175-183.

Kee, R. A.; Gauthier, M. (2008). Arborescent Polystyrene-graft-poly(tert-butyl methacrylate) Copolymers: Synthesis and Enhanced Polyelectrolyte Effect in Solution. *J. Polym. Sci., Part A: Polym. Chem.*, 46, 2335-2346.

Njikang, G; Gauthier, M.; Li, J. (2008). Arborescent Polystyrene-graft-Poly(2-vinylpyridine) Copolymers as Unimolecular Micelles. *Solubilization Studies. Polymer*, 49, 1276-1284.

Njikang, G. N.; Cao, L.; Gauthier, M. (2008). Self-assembly of Arborescent Polystyrene-graft-Poly(ethylene oxide) Copolymers at the Air-water Interface. *Macromol. Chem. Phys.*, 209, 907-918.

Munam, A.; Gauthier, M. (2008). Large-scale Synthesis of Arborescent Polystyrenes. *J. Polym. Sci., Part A: Polym. Chem.*, 46, 5742-5751.

Dockendorff, J.; Gauthier, M.; Mourran, A.; Möller, M. (2008). Arborescent Amphiphilic Copolymers as Templates for the Preparation of Gold Nanoparticles. *Macromolecules*, 41, 6621-6623.

Mayer, C.; Zaccarelli, E.; Stiakakis, E.; Likos, C. N.; Sciortino, F.; Munam, A.; Gauthier, M.; Hadjichristidis, N.; Iatrou, H.; Tartaglia, P.; Löwen, H.; Vlassopoulos, D. (2008). Asymmetric Caging in Soft Colloidal Mixtures. *Nature Materials*, 7, 780-784.

Il Yun, S.; Gadd, G. E.; Lo, V.; Gauthier, M.; Munam, A. (2008). Temperature-Responsive Supramolecular Assembly of Dendrigrft Micelles with a Solvophilic Core – Solvophobic Shell Structure. *Macromolecules*, 41, 7166-7172.

Njikang, G. N.; Cao, L.; Gauthier, M. (2008). Pressure- and Temperature-Induced Association of Arborescent Polystyrene-graft-Poly(ethylene oxide) Copolymers at the Air-water Interface. *Langmuir*, 24, 12919-12927.

Njikang, G. N.; Gauthier, M.; Li, J. (2008). Sustained Release Properties of Arborescent Polystyrene-graft-Poly(2-vinylpyridine) Copolymers. *Polymer*, 49, 5474-5481.

Ramirez, I., S. Jayaram, E.A. Cherney, M. Gauthier, L. Simon (2009). Erosion resistance and Mechanical Properties of Silicone Nanocomposite Insulation. *IEE Trans. Dielectr. Electr. Insul.*, 16, 52-59.

N. McManus

McManus, N. T., G. L. Rempel (2008). Improvements in the Hydrogenation of Nitrile Rubber using Wilkinson's Catalyst. *Rubber Chemistry and Technology*, 81 (2), 2008, 277 – 243.

Nabifar A. , N.T. McManus, E. Vivaldo-Lima, L.M.F. Lona, A. Penlidis (2008). A replicated investigation of nitroxide-mediated radical polymerization of styrene over a range of reaction conditions. *Canadian Journal of Chem. Eng., Acc.*, 86, 2008, 879 – 893.

Nabifar A., Neil T McManus; A. Penlidis, Eduardo Vivaldo-Lima; Liliane M. F Lona (2008). Thermal Polymerization of Styrene in the Presence of TEMPO. *Chemical Engineering Science*, 64, 2009, 304 – 312.

Roa-Luna M., A. Nabifar, N. T McManus; A. Penlidis, E. Vivaldo-Lima and L. M. F Lona (2008). Effect of the Addition of Inert or Tempo capped Prepolymer on Polymerization Rate and Molecular Weight Development in the Nitroxide-Mediated Radical Polymerization of Styrene. *J. Appl. Polym. Sci.*, 109, 3665 – 3678.

A. Penlidis

Jaramillo-Soto, G., M.L. Castellanos-Cardenas, P.R. Garcia-Moran, E. Vivaldo-Lima, G. Luna-Barcenas and A. Penlidis (2008). Simulation of RAFT dispersion polymerization in supercritical carbon dioxide. *Macromol. Theory Simul.*, 17 (6), 280-289.

Nabifar, A., N.T. McManus, E. Vivaldo-Lima, L. Lona and A. Penlidis (2008). A replicated investigation of NMRP of styrene over a range of reaction conditions. *Can. J. Chem. Eng.*, 86 (5), 879-892 **(one of the top 25 accessed articles in journal in 2008)**.

Cheng, J.J., M.A. Polak and A. Penlidis (2008). A tensile strain hardening test indicator of environmental stress cracking resistance. *J. Macromol. Sci., Pure and Appl. Chem.*, A 45, 599-611.

Bulsari, M.P., C. Tzoganakis and A. Penlidis (2008). Hydrosilylation of impact polypropylene copolymer in a twin-screw extruder. *J. Elast. And Plast.*, 40, 365-380.

Roa-Luna, M., A. Nabifar, N.T. McManus, E. Vivaldo-Lima, L. Lona and A. Penlidis (2008). Effect of the addition of inert or TEMPO-capped prepolymer in the NMRP of styrene. *J. Appl. Polym. Sci.*, 109 (6), 3665-3678.

Hauch, E., X. Zhou, T.A. Duever and A. Penlidis (2008). Estimating reactivity ratios from triad fraction data. *J. Macromol. Symp.* 271 (1), 48-63.

Alvarado-Contreras, J.A., M.A. Polak and A. Penlidis (2008). Computational study on a damage-coupled model for crystalline polyethylene. *Eng. Comput., Intern. J. CAE-Soft.*, 25 (7/8), 612-636.

Fujisawa, T. and A. Penlidis (2008). Copolymer composition control policies: characteristics and applications. *J. Macromol. Sci., Pure and Appl. Chem.*, 45 (2), 115-132.

Liu, H., M.A. Polak and A. Penlidis (2008). A practical approach to modeling time-dependent non-linear creep behavior of polyethylene for structural applications. *Polym. Eng. Sci.*, 48 (1), 159-167.

J.B.P. Soares

Mehdiabadi, S, JBP Soares, AH Dekmezian (2008). Simulation of polymerization and long chain branch formation in a semi-batch reactor using two single-site catalysts. *Macromol React Eng* 2008, 2, 37-57.

Soares, JBP, AE Hamielec (2008). Chain length distributions of polyolefins made with coordination catalysts at very short polymerization times – Analytical solution and Monte Carlo simulation for non-instantaneous site activation. *Macromol React Eng* 2008, 2, 115-125.

Mehdiabadi, S., JBP Soares, AH Dekmezian (2008). Production of long chain branched polyolefins with two single-site catalysts: Comparing CSTR and semi-batch performance. *Macromol React Eng* 2008, 2, 529-550.

Alghyamah, AA, JBP Soares (2008). Simultaneous deconvolution of the bivariate distribution of molecular weight and chemical composition of polyolefins made with Ziegler-Natta catalysts. *Macromol Rapid Commun.* DOI:10.1002/marc.200800592.

C. Tzoganakis

Tasanatanachai, P., C. Tzoganakis, R. Magaraphan (2008). Rheological Modification of LLDPE through Reactive Processing with Peroxide. *Intern. Polymer Processing*, 168 - 172

Park, H., C.B. Park, C. Tzoganakis, K.-H. Tan, P. Chen (2008). Simultaneous Determination of the Surface Tension and Density of Polystyrene in Supercritical Nitrogen. *Ind. Eng. Chem. Res.*, 47, 4369 - 4373

Bulsari, M., C. Tzoganakis and A. Penlidis (2008). Hydrosilylation of Impact Polypropylene Copolymer in a Twin-Screw Extruder. *J. Elast. Plast.*, 40, (2008), 365 - 380

Yeetsorn, R., M. Fowler, C. Tzoganakis, Y. Wang, T. Mali (2008). Polypropylene Composites for Polymer Electrolyte Membrane Fuel Cell Bipolar Plates. *Macromol. Symp.*, 264, 34 - 43

Zhu, S.-H., and C. Tzoganakis (2008). Surface Properties of Hydrosilylated Polyolefins Annealed in Supercritical Carbon Dioxide. *Polym. Adv. Technol.*, 19, 258 - 269

E. Vivaldo Lima

Soriano-Moro, J.G., J. C. Rico-Valverde, F. J. Enriquez-Medrano, H. Maldonado-Textle, E. Vivaldo-Lima, R. Acosta-Ortiz, and R. Guerrero-Santos (2008). Toward a Living Radical Polymerization of Styrene by Using Dithiolactone as a New Type of Mediating Agent, *Macromol. Rapid Commun.*, 29, 80-85.

Roa-Luna, M., A. Nabifar, N.T. McManus, E. Vivaldo-Lima, L.M.F. Lona, and A. Penlidis (2008). Effect of the Addition of Inert or TEMPO-Capped Prepolymer on Polymerization Rate and Molecular Weight Development in the Nitroxide-Mediated Radical Polymerization of Styrene, *J. Appl. Polym. Sci.*, 109(6), 3665-3678.

Quintero-Ortega, I.A., G. Jaramillo-Soto, P.R. García-Morán, M. L. Castellanos-Cárdenas, G. Luna-Bárceñas, and E. Vivaldo-Lima (2008). A Comparison of Modeling Approaches for Dispersion Homopolymerization of MMA and Styrene in Supercritical CO₂, *Macromol. React. Eng.*, 2, 304-320.

Jaramillo-Soto, G., M.L. Castellanos-Cárdenas, P.R. García-Morán, E. Vivaldo-Lima, G. Luna-Bárceñas, and A. Penlidis (2008). Simulation of RAFT Dispersion Polymerization in Supercritical Carbon Dioxide, *Macromol. Theory Simul.*, 17, 280-289.

Nabifar, A., N.T. McManus, E. Vivaldo-Lima, L. M. F. Lona, and A. Penlidis (2008). A Replicated Investigation of Nitroxide-Mediated Radical Polymerization of Styrene over a Range of Reaction Conditions, *Can. J. Chem. Eng.*, 86(5), 879-892.

Luna-Bárceñas, G., B. González-Campos, E.A. Elizalde-Peña, E. Vivaldo-Lima, J.F. Louvier-Hernández, Y.V. Vorobiev, and J. González-Hernández (2008). FEMO modelling of optical properties of natural biopolymers Chitin and Chitosan, *Physica Status Solidi C*, 5(12), 3736-3739.

12. PAPERS IN FULL REFEREED CONFERENCE PROCEEDINGS

M. Gauthier

Il Yun, S.; K. Hammerton, M. Gauthier, (2008). Interactions of Cationic Dendrigraft Polymers with Oligonucleotides and Morphology of the Resulting Complexes. *Polym. Mater. Sci. Eng.*, 98,748-749.

Ramirez, I., S. Jayaram, E.A. Cherney, M. Gauthier, M. (2008). Study of Laser Ablation and Mechanical Properties of Silicone Rubber Nanocomposites. *Proc. ESA Annual Meeting on Electrostatics*, Paper B3 (published on-line).

A. Penlidis

Alvarado-Contreras, J.A., M.A. Polak and A. Penlidis (2008). Modeling damage of the crystalline phase in semicrystalline polyethylene. Proceedings of Multiscale Materials Modeling (MMM 2008), 4th Intern. Conf., Oct. 27-31, 2008, pgs. 333-336, Tallahassee, FL, USA.

Ximenes, J.B., L. Lona, T. Nogueira, N.T. McManus, E. Vivaldo-Lima and A. Penlidis (2008). Simulating controlled/living free radical polymerization reactor. Proceedings of PPS, 24th Annual Mtg., PPS-24, June 15-19, 2008, Salerno, Italy.

Nogueira, T., L. Lona, A. Penlidis, N.T. McManus and E. Vivaldo-Lima (2008). NMRP copolymerization of styrene and divinyl benzene. Proceedings of PPS, 24th Annual Mtg., PPS-24, June 15-19, 2008, Salerno, Italy.

C. Tzoganakis

Zatloukal, M., R. Pivokonsky, P. Filip, C. Tzoganakis (2008). Rheological Characterization and Modeling of Metallocene-Based Polypropylenes Prepared by Reactive Extrusion Process. 66th Annual Technical Conference of the Society of Plastics Engineers, May 2008, Milwaukee, WI, USA, 862 - 867.

Ortiz, E. and C. Tzoganakis (2008). Scale-up Calculations for Reactive Extrusion operations. 66th Annual Technical Conference of the Society of Plastics Engineers, May 2008, Milwaukee, WI, USA, 305 - 309.

Zhu, S.-H., C. Tzoganakis, T. Shigeishi and K. Chikara (2008). Analysis of Mixing in a Variable Speed Co-rotating Intermeshing Twin-Screw Extruder", 66th Annual Technical Conference of the Society of Plastics Engineers, May 2008, Milwaukee, WI, USA, 1437 - 1441.

Zhu, S.-H. and C. Tzoganakis (2008). A Novel Technique to Detect Small Molecules of Low Concentration in Polymer Blends by RuO₄ Staining. 66th Annual Technical Conference of the Society of Plastics Engineers, May 2008, Milwaukee, WI, USA, 2077 - 2081.

13. CONFERENCE PRESENTATIONS/INVITED SEMINARS

J. Duhamel

Keyes-Baig, C., J. Duhamel (2008). Electron Transfer in DNA: A Fluorescence Blob Model Approach. 91st CSC Conference in Edmonton, AL, Canada, May 24-28, 2008.

Siu, H., J. Duhamel, (2008). Studying Water-soluble Associative Thickeners by a Combination of Fluorescence and Rheology. 91st CSC Conference in Edmonton, AL, Canada, May 24-28, 2008.

Ingratta, M., J. Duhamel (2008). Comparing the Dynamics of Encounters between Chain Ends or Random Intrachain Segments with Pyrene-labeled Polymers in Solution. 91st CSC Conference in Edmonton, AL, Canada, May 24-28, 2008.

Invited lecturer sponsored by the Centre for Self-Assembled Chemical Structures (CSACS) (2008). Bridging the Molecular to Macroscopic Divide Using Fluorescence: Application to the Study of Associative Polymers

- Université de Sherbrooke, Sherbrooke, QC, January 21, 2008
- McGill University, Montréal, QC, January 22, 2008
- Université de Montréal, Montréal, QC, January 23, 2008
- Université Laval, Québec, QC, January 24, 2008

Ingratta, M., J. Hollinger, J. Duhamel (2008). Pros and Cons of End-to-end Chain Cyclization versus Random Intrachain Encounters. XVII International Materials Research Congress, Cancun, August 17-21, 2008.

Duhamel, J. (2008). Characterization by Fluorescence of the Highly Viscous Interior of Micellar Aggregates of Styrene-Maleic Anhydride Dispersants. BASF Res. Center, Wyandotte, MI, USA, Oct. 28th, 2008.

Duhamel, J. (2008). Titration and Association of Amphiphilic Polypeptides Having Well-defined Sequences. BASF Research Center in Wyandotte, MI, USA, October 28th, 2008.

X. Feng

Fouad, E.A. and X. Feng (2008). Butanol separation from dilute aqueous solutions by pervaporation. 58th Canadian Chemical Engineering Conference, Ottawa, ON, Oct 19-22, 2008.

Du, R., P.M. Huck, S. Peldszus, X. Feng and A. Chakma (2008). Studies on poly(N,N-dimethyl aminoethyl methacrylate) positively charged composite membranes for nanofiltration. 58th Canadian Chemical Engineering Conference, Ottawa, ON, Oct 19-22, 2008.

Du, R., A. Chakma and X. Feng (2008). Natural gas dehydration by poly(N,N-dimethyl aminoethyl methacrylate) composite membranes. 58th Canadian Chemical Engineering Conference, Ottawa, ON, Oct 19-22, 2008.

Zhou, Y., S. Yu, C. Gao and X. Feng (2008). Surface modification of an aromatic polyamide membrane by self-assembly of polyethyleneimine on the membrane surface. 2008 International Congress on Membranes and Membrane Processes, Honolulu, Hawaii, July 12-18, 2008.

Hao, X., M. Pritzker and X. Feng (2008). Use of pervaporation for the separation of phenol from dilute aqueous solutions. 2008 International Congress on Membranes and Membrane Processes, Honolulu, Hawaii, July 12-18, 2008.

Feng, X. (2008). Membranes for chemical and environmental applications, **Invited Talk**. Taiyuan University of Technology, Taiyuan, China, Sept. 1, 2008.

Feng, X. (2008). CO₂ separation from flue gas and natural gas by hollow fibers: Experimental and modeling studies, **Invited Presentation**. Petrobras International Symposium on CO₂ Capture and Geological Storage, Salvador, Brazil, Sept 9-12, 2008.

M. Gauthier

Il Yun, S.; Hammerton, K.; Gauthier, M. (2008). Interactions of Cationic Dendrigraft Polymers with Oligonucleotides and Morphology of the Resulting Complexes. ACS Meeting, April 2008, New Orleans, LA.

Ramirez, I.; Jayaram, S.; Cherney, E. A.; Gauthier, M. (2008). Study of Laser Ablation and Mechanical Properties of Silicone Rubber Nanocomposites. 93rd ESA Annual Meeting on Electrostatics, August 2008, Milwaukee, WI.

Gauthier, M. (2008). Physical Properties Tailoring via Ionic Interactions: An Introduction to Ionomers, **Invited Talk**, Lanxess, Sarnia, ON, June 2008.

N. McManus

Zhou M., N. T. McManus and A. Penlidis (2008). Kinetics Study of Nitroxide-Mediated Radical Polymerization of Styrene with a Unimolecular Initiator. CSChE, October 2008, Ottawa, Ontario, Canada.

A. Penlidis

Zhou, M.X., N.T. McManus and A. Penlidis (2008). Kinetic studies of NMRP of styrene with a unimolecular initiator. 58th CSChE Conf., Ottawa, Oct. 19-22, 2008.

Washington, I.D., T.A. Duever and A. Penlidis (2008). Dynamic modeling of a continuous reactor train for the industrial production of nitrile rubber. 58th CSChE Conf., Ottawa, Oct. 19-22, 2008.

Nabifar, A., N.T. McManus, A. Penlidis, E. Vivaldo-Lima and L. Lona (2008). Thermal NMRP of styrene. 58th CSChE Conf., Ottawa, Oct. 19-22, 2008.

Jung, W., T.A. Duever and A. Penlidis (2008). Studies on chemical heterogeneity of multicomponent polymers: Sequence length distributions. 58th CSChE Conf., Ottawa, Oct. 19-22, 2008.

Cheng, J.J., M.A. Polak and A. Penlidis (2008). Strain hardening test and its relation to ESCR of polyethylene. 58th CSChE Conf., Ottawa, Oct. 19-22, 2008.

Cheng, J.J., M.A. Polak and A. Penlidis (2008). Molecular structural relationship between tensile strain hardening and ESCR of polyethylene. Intern. Conf. Polyolefin Characterization (ICPC), Sept. 14-17, 2008, Valencia, Spain.

Nabifar, A., M. Zhou, N.T. McManus and A. Penlidis (2008). An update on the kinetic investigation of NMRP of styrene. IAMC 4th Workshop, Feb. 17-23, 2008, Mexico City.

Zhu, S.-H., N.T. McManus, C. Tzoganakis and A. Penlidis (2008). "Designing" an effective processing aid. **Invited presentation**, IAMC 4th Workshop, Feb. 17-23, 2008, Mexico City.

J.B.P. Soares

Soares, JBP, S Mehdiabadi (2008). Influence on metallocene type on the order of ethylene polymerization rate and catalyst deactivation rate in a solution reactor.

International Conference on the Reaction Engineering of Polyolefins, Montreal, Quebec, Canada, June 22-27, 2008.

Perez, F., JBP Soares (2008). Process simulation for ethylene polymerization in CSTR slurry reactors. International Conference on the Reaction Engineering of Polyolefins, Montreal, Quebec, Canada, June 22-27, 2008.

Shin, SY, LC Simon, JBP Soares (2008). Gas phase production of polyethylene nanocomposites. International Conference on the Reaction Engineering of Polyolefins, Montreal, Quebec, Canada, June 22-27, 2008.

Mehdiabadi, S, JBP Soares (2008). Production of branch-block olefin copolymer in semi-batch and continuous stirred-tank reactors. International Conference on the Reaction Engineering of Polyolefins, Montreal, Quebec, Canada, June 22-27, 2008.

Maneshi, A., LC Simon, JBP Soares (2008). In-situ polyethylene/clay nanocomposites. International Conference on the Reaction Engineering of Polyolefins, Montreal, Quebec, Canada, June 22-27, 2008.

Soares, JBP, P Somnukguandee, S Anantawaraskul (2008). Simulation of CRYSTAF profiles of linear olefin block copolymers. 2nd International Conference on Polyolefin Characterization, Valencia, Spain, September 14-17, 2008.

Anantawaraskul, S., W Bongsontia, JBP Soares (2008). Simultaneous deconvolution of molecular weight distribution and chemical composition distribution of polyolefins synthesized with multi-site type catalysts. 2nd International Conference on Polyolefin Characterization, Valencia, Spain, September 14-17, 2008.

Khokar, ZH, M Al-Harhi, JBP Soares (2008). Dynamic Monte Carlo simulation of chain shuttling polymerization. 10th Annual UNESCO / IUPAC Conference on Macromolecules & Materials, Krueger Park, South Africa, September 8-11, 2008.

Alshaiban, A, JBP Soares (2008). Simulation of propylene polymerization in industrial reactors using Ziegler-Natta catalysts in the presence of electron donors. International Conference on the Reaction Engineering of Polyolefins, Montreal, Quebec, Canada, June 22-27, 2008.

Alghyamah, AA, JBP Soares (2008). Simultaneous Deconvolution of Molecular Weight and Chemical Composition Distributions of Polyolefins Made with Ziegler-Natta Catalysts. International Conference on the Reaction Engineering of Polyolefins, Montreal, Quebec, Canada, June 22-27, 2008.

Maneshi, A, LC Simon, JBP Soares (2008). Polyethylene/clay nanocomposites. International Conference on the Reaction Engineering of Polyolefins, Montreal, Quebec, Canada, June 22-27, 2008.

Alghyamah, AA, JBP Soares (2008). Simultaneous deconvolution of experimental GPC and CRYSTAF/TREF curves including the soluble fraction. 2nd International Conference on Polyolefin Characterization, Valencia, Spain, September 14-17, 2008.

Khokar, ZH, M Al-Harhi, JBP Soares (2008). Dynamic Monte Carlo simulation of chain shuttling polymerization. 10th Annual UNESCO / IUPAC Conference on Macromolecules & Materials, Krueger Park, South Africa, September 8-11, 2008.

Invited Lectures:

- Graduate lectures on coordination polymerization. King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia, April 26 and 28, 2008.
- A review of differentiated commodity, specialty and hybrid polyolefins. Thai Institute of Chemical Engineering (TICChE), Bangkok, Thailand, June 5, 2008.
- On the mathematical modeling of polyolefin microstructures. Department of Chemical Engineering, Kasetsart University, Bangkok, Thailand, June 6, 2008.
- Differentiated commodity, specialty and hybrid polyolefins. Department of Chemical Engineering, Rey Juan Carlos University, Móstoles, Spain, July 9, 2008.
- Differentiated commodity, specialty and hybrid polyolefins. CID: Centro de Investigación y Desarrollo Tecnológico SA de CV, Lerma, Mexico, September 2, 2008.
- Polyolefins: State-of-the-Art on Mathematical Modeling, Novel Molecular Architectures, and Characterization. CIQA: Centro de Investigación en Química Aplicada, Saltillo, Mexico, September 3, 2008.
- Mathematical Modeling of Polyolefin Microstructure: An Overview. V Foro Regional, Instituto Mexicano de Ingenieros Químicos, Coatzacoalcos, Vera Cruz, Mexico, September 3-5, 2008.
- How to Improve MI Catalyst Batch Consistency: Manufacturing, Testing and Processing, Sharq, Jubail, Saudi Arabia, December 16, 2008.
- Reactor Sensitivity and Load Limitation During Low MI Grade Production, Sharq, Jubail, Saudi Arabia, December 16, 2008.

E. Vivaldo Lima

Vivaldo Lima, E. (2008). Modeling of Controlled Radical Polymerization Processes in Homogeneous and Heterogeneous Phases, 1st US-Mexico Symposium on Advances in Polymer Science (MACROMEX 2008), Los Cabos, BCS, México, December 7-10, 2008.

García Morán, P.R., G. Jaramillo Soto, and E. Vivaldo Lima (2008). Experimental Study on the Free-Radical Copolymerization Kinetics of Styrene and Divinylbenzene with Crosslinking in Supercritical Carbon Dioxide (poster), 1st US-Mexico Symposium on Advances in Polymer Science (MACROMEX 2008), Los Cabos, BCS, México, December 7-10, 2008.

Jaramillo Soto, G., P.R. García Morán, and E. Vivaldo Lima (2008). Reversible Addition-Fragmentation Transfer (RAFT) Dispersion Polymerization in Supercritical Carbon Dioxide (scCO₂) (poster), 1st US-Mexico Symposium on Advances in Polymer Science (MACROMEX 2008), Los Cabos, BCS, México, December 7-10, 2008.

14. PATENTS/MAJOR TECHNICAL REPORTS/CHAPTERS IN BOOKS

X. Feng

X. Feng and J. Ivory, Hollow-fiber membrane devices and methods of assembly, Canadian Patent No. 2,368,065 (issued July 8, 2008).

P.S. Herrera, X. Feng, J. Payzant and J.H. Kim, Process for the separation of olefins from paraffins using a membrane, US Patent No. 7,361,800 (issued April 22, 2008).

J.B.P. Soares

JBP Soares. Advances in polyolefins conference. The Metallocene and Single-Site Catalyst Monitor XVI (5), 4-10, 2008.

15. OTHER HIGHLIGHTS

Many thanks to Dr. Carla McBain, a long-time friend of IPR, for coordinating many interesting interactions with OMNOVA Solutions Inc. IPR is grateful for OMNOVA's help for graduate student awards and scholarships.

Many thanks to Dr. Klaus-Dieter Hungenberg of BASF, a long-time friend of IPR, for coordinating many interesting interactions with BASF in Germany, USA and Canada.

During 2008, IPR had several interactions with non-member companies like: MaxTech, Waterloo, ON; LS Polymer Technology, Germany; WPI Solutions, PA, USA, and offered assistance to many graduate students from departments other than Chemical Engineering and Chemistry: Mechanical Engineering, UW; Conestoga College, Waterloo, ON; Electrical Engineering UW; and Civil Engineering, UW.

Professor Soares was a co-organizer for the 4th International Conference on the Reaction Engineering of Polyolefins (Incorep IV), Montreal, Quebec, Canada, June 22-27, 2008, and the 2nd International Conference on Polyolefin Characterization, Valencia, Spain, September 14-17, 2008.

IPR is heavily involved in the co-organization of Polymer Reaction Engineering (PRE 7) conference, May 3-8, 2009, Niagara Falls, Ontario.

Professor Soares is a Member of the Executive Advisory Board of Wiley-VCH Macromolecular Journals and responsible for the Macromolecular Reaction Engineering section of Macromolecular Materials Engineering and Associate Editor of the Brazilian Journal of Chemical Engineering.

Professor Dhib spent a 4-month sabbatical leave at Mascara University Centre (Algeria) where he worked with Prof. A. Yahiaoui on "Hydrosoluble Polymers of Oxazoline using Catalyst Maghnite-H".

Nanotechnology Engineering: New undergraduate engineering program BASc Nanotechnology Engineering started in Sept 05. This is a co-op program and it will deliver skills on nanoengineered polymers and materials. For more information about the skills and hiring coop students visit www.nanotech.uwaterloo.ca.

Professor Penlidis is Editorial Board Member: J. Macromol. Sci.-Pure and Appl. Chem.; Polymer-Plastics Techn. and Eng.; and Macromol. React. Eng. J.

A fruitful collaboration between Chemical Eng. (Prof. Penlidis) and Civil Eng. (Prof. Marianna Polak) in structural characteristics of pipes (relating micro-structural properties to macro-mechanical properties and modeling of damage mechanics) has led to the formation of the "Creeps" group (three PhD students, and several MASc and undergraduate design projects), with regular meetings and research interactions, including industrial collaborators like Imperial Oil, Canada.

Professor Vivaldo-Lima was organizer and Professor Penlidis was workshop co-organizer/participant; Fourth InterAmerican Materials Collaboration/CRO Workshop, Feb 17-23, 2008, 2008, Mexico City, Mexico; 6 academics/20 PhD students from UW/UNAM, Mexico/U. of Campinas, Brazil

Professor Penlidis was organizer/lecturer; 2-day in-house industrial course on emulsion polym. and latex rubber production, May 1-2, 2008, OMNOVA Solutions USA (Fairlawn, OH); 27 scientists/engineers

Professor Penlidis was organizer/lecturer; 2-day in-house industrial course on troubleshooting polymerizations, with T. Duever, June 5-6, 2008, BASF, Ludwigshafen, Germany; 30 scientists/engineers

Professor Penlidis hosted the Early Childhood Education Centre (ECEC) class, Dept. of Psychology, for educational experiments with polymers, 8 pre-school kids. IPR PhD students Joy Cheng and Afsaneh Nabifar participated as "teachers/lab demonstrators" during the May 21, 2008, visit. It was a very successful and enjoyable "field trip" for the ECEC youngsters (and future chemical and polymer engineers!), who learned how to make "polymeric snow" and heard about the many applications of synthetic and natural macromolecules. IPR donated lab coats and safety glasses to the future scientists. The youngsters returned a few days later with a large poster of their thanks and impressions of the day!

Prof. Soares organized and gave the following industrial short courses:

- Polyolefin Reaction Engineering Topics. King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia, April 26-29, 2008 (w/ L. Simon and T. McKenna).
- Polyolefin Reaction Engineering, Petrobras/CENPES, Rio de Janeiro, Brazil, May 19-21, 2008.
- Polyolefin Reaction Engineering, Thai Polyethylene Co., Bangkok, Thailand, June 2-4, 2008.
- Introduction to Polyolefin Reaction Engineering, Total Petrochemicals, Deer Park, Texas, USA, December 2-3, 2008.
- Polyolefin Reaction Engineering, Sharq, Jubail, Saudi Arabia, December 13-15, 2008 (with T. McKenna).

Professor McManus successfully organized and set up a teaching laboratory in polymerization and polymer characterization for the third year students in the Nanotechnology Engineering program. The first time through, Fall of 2008, went very well.

Professor Vivaldo-Lima's PhD student, Dr. Martha Roa-Luna (graduated from UNAM in Feb. 2008), obtained a Professor position at Universidad Veracruzana, Coatzacoalcos, Veracruz, Mexico.

INSTITUTE FOR POLYMER RESEARCH
CELEBRATING 24 YEARS OF OFFICIAL INSTITUTE STATUS
THIRTIETH ANNUAL SYMPOSIUM
ON POLYMER SCIENCE/ENGINEERING
2008

Conrad Grebel College
Great Hall
University of Waterloo, Waterloo, Ontario
Tuesday, May 13, 2008

8:30 a.m.	Coffee
8:50	Welcome and Opening Remarks
9:00 - 9:30	Mark Ingratta, Chemistry, Waterloo (Winner of 2007 IPR Award for Academic Excellence in Polymer Science/Engineering) End-to-end vs. random intra-chain segment encounters. A fluorescence study.
9:30 - 10:30	Professor Michael Tam, Chemical Engineering, Waterloo Design of polymeric nanostructures for chemical and biomedical applications
10:30 - 11:00	Coffee
11:00 - 11:30	Joy Cheng, Chemical Engineering, Waterloo Tensile strain hardening test indicator of environmental stress cracking resistance of high density polyethylene
11:30 - 12:00 p.m.	Estanislao Ortiz Rodriguez, Chemical Engineering, Waterloo (Winner of 2007 IPR Award for Academic Excellence in Polymer Science/Engineering) Scaling-up a reactive extrusion operation
12:15 - 1:00	Lunch
1:00 - 1:30	Ahmad Alshaiban, Chemical Engineering, Waterloo Active site identification and mathematical modeling of polypropylene made with Ziegler-Natta catalysts
1:30 - 2:00	Anthony Shin, Chemical Engineering, Waterloo Ethylene-acrylonitrile copolymerization with Ni-diimine/EASC/Clay catalyst system
2:00 - 2:30	Mike Fowler, Chemistry, Waterloo Determination of pH-ionization behavior for a series of amphiphilic polypeptides

- 2:30 - 3:00 **Christine Keyes, Chemistry, Waterloo**
Electron transfer in DNA: a fluorescence blob model approach
- 3:00 - 3:30 **Coffee**
- 3:30 - 4:00 **Howard Siu, Chemistry, Waterloo**
Rheology under the microscope: tracking changes of a networked associative polymer under shear at the molecular level
- 4:00 - 4:30 **Michelle Zhou, Chemical Engineering, Waterloo**
Kinetic studies of nitroxide mediated radical polymerization of styrene with a unimolecular initiator
- 4:30 - 5:00 **Woosung Jung, Chemical Engineering, Waterloo**
Studies on chemical heterogeneity of multi-component polymers: sequence length distributions
- 5:00 **Closing remarks**
- 6:00 - 7:30 **IPR Industrial Member DINNER**
University Club, Main Dining Room
- 7:30 - 9:30 **Poster Presentations and Informal Get-together**
University Club, Main Dining Room
(IPR graduate students/researchers and symposium participants)

POSTER SESSION
TUESDAY MAY 13, 2008
UNIVERSITY CLUB
7:30 pm

Hafiz Azam Chem Eng, Ryerson	Polystyrene based ion-exchange resin for protein bioseparation in a novel fluidized system
Yashar Behjat/Joy Cheng Civil Eng/Chem Eng, Waterloo	Relationship between environmental stress cracking resistance and creep properties in polyethylene
Md Zia-Ul Islam Chem Eng, Ryerson	Modeling of infrared drying of polymer solution
Chandramouli Madhuranthakam/ Ian Washington Chem Eng, Waterloo	Dynamic modeling and optimization of acrylonitrile/butadiene (NBR) emulsion copolymerization in a continuous reactor train
Mohammad Meysami Chem Eng, Waterloo	Devulcanization of recycled tire rubber through processing with supercritical CO ₂
Afsaneh Nabifar Chem Eng, Waterloo	Optimal Bayesian design of experiments applied to complex polymerization processes
Amir Sani Chem Eng, Ryerson	Acrylic polymers surface graft copolymerization with acetylated bacterial cellulose nanofibers
Andy Sun Chem Eng, Waterloo	Formation of poly(vinylidene fluoride) hollow fiber membranes: kinetic and thermodynamic investigations
Ian Washington Chem Eng, Waterloo	Simulation studies of the emulsion copolymerization of AN/Bd in batch/continuous and trains of continuous reactors

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PREPRINTS 2008

- 08/001 **Arborescent polystyrene-graft-poly(2-vinylpyridine) copolymers as unimolecular micelles: solubilization studies**
G. Njikang, M. Gauthier, J. Li
Polymer, Acc., 01/08
- 08/002 **Estimating reactivity ratios from triad fraction data**
E. Hauch, X. Zhou, T.A. Duever and A. Penlidis
Macromol Symp., Acc., 02/08
- 08/003 **Self-assembly of arborescent polystyrene-graft-poly(ethylene oxide) copolymers at the air-water interface**
G.N. Njikang, L. Cao, M. Gauthier
Macromol. Chem. And Phys., Acc., 02/08
- 08/004 **Improvements in the hydrogenation of nitrile rubber using Wilkinson's catalyst**
N.T. McManus, G.L. Rempel
Rubber Chem and Tech., Acc., 03/08
- 08/005 **Hydrosilylation of impact polypropylene co-polymer in a twin-screw extruder**
M.P. Bulsari, C. Tzoganakis, A. Penlidis
J. Elast. Plastics, Acc., 03/08
- 08/006 **Effect of the addition of inert or TEMPO-capped prepolymer on polymerization rate and molecular weight development in the nitroxide-mediated radical polymerization of styrene**
M. Roa-Luna, A. Nabifar, N.T. McManus, E. Vivaldo-Lima, L.M.F. Lona, A. Penlidis
J. Appl. Polym. Sci., Acc., 03/08
- 08/007 **Simulation of reversible addition-fragmentation transfer (RAFT) Dispersion polymerization in supercritical carbon dioxide**
G. Jaramillo-Soto, M. Luz Castellanos-Cardenas, P.R. Garcia-Moran, E. Vivaldo Lima, G. Luna-Barcenas, A. Penlidis
Macromol. Theory Simul., Acc., 03/08
- 08/008 **A comparison of modeling approaches for dispersion homopolymerization of methyl methacrylate (MMA) and styrene in supercritical carbon dioxide**
I.A. Quintero-Ortega, G. Jaramillo-Soto, P.R. Garcia-Moran, M. Luz Catellanos-Cardenas, G.Luna-Barcenas, E. Vivaldo-Lima
Macromol. React. Eng., Acc., 04/08
- 08/009 **A tensile strain hardening test indicator of environmental stress cracking resistance**
J.J. Cheng, M.A. Polak, A. Penlidis
J. Macromol. Sci., Pure and Appl. Chem., Acc., 04/08

- 08/010 **Effect of side-chain length on the side-chain dynamics of a α -helical poly(L-glutamic acid) as probed by a fluorescence Blob model**
M.W. Ingratta and J. Duhamel
J. Phys. Chem B, Acc., 04/08
- 08/011 **A case for using randomly labeled polymers to study long range polymer chain dynamics by fluorescence**
M.W. Ingratta, J. Hollinger, J. Duhamel
J. Am. Chem. Soc., Acc., 05/08
- 08/012 **Large-scale synthesis of arborescent polystyrenes**
A. Munam and M. Gauthier
J. Poly. Sci., A: Poly. Chem., Acc., 05/08
- 08/013 **A replicated investigation of nitroxide-mediated radical polymerization of styrene over a range of reaction conditions**
A. Nabifar, N.T. McManus, E. Vivaldo-Lima, L.M.F. Lona, A. Penlidis
Can. J. Chem. Eng., Acc., 06/08
- 08/014 **Asymmetric caging in soft colloidal mixtures**
C. Mayer, E. Zaccarelli, E. Stiakakis, C.N. Likos, F. Sciortino, A. Munam, M. Gauthier, N. Hadjichristidis, H. Iatrou, P. Tartaglia, H. Lowen, D. Vlassopoulos
Nature Materials, Acc., 07/08
- 08/015 **Arborescent amphiphilic copolymers as templates for the preparation of gold nanoparticles**
J. Dockendorff, M. Gauthier, A. Mourran and M. Moller
Macromol. (communication to the editor), Acc., 08/08
- 08/016 **Temperature-responsive supramolecular assembly and morphology of arborescent copolymer micelles with a solvophilic core—solvophobic shell structure**
S. I. Yun, G.E. Gadd, V. Lo, M. Gauthier, A. Munam
Macromol., Acc., 08/08
- 08/017 **Pressure- and temperature-induced association of arborescent polystyrene- graft-poly(ethylene oxide) copolymers at the air-water interface**
G.N. Njikang, L. Cao, M. Gauthier
Langmuir, Acc., 09/08
- 08/018 **Modeling of ethylene polymerization with difunctional initiators in tubular reactors**
P.K.F. Khazraei, R. Dhib
J. App. Polym. Sci, 109, 3908-3922, 2008
- 08/019 **Sustained release properties of arborescent polystyrene-graft-poly (2-vinylpyridine) copolymers**
G.N. Njikang, M. Gauthier, J. Li
Polymer, Acc., 10/08
- 08/020 **Thermal polymerization of styrene in the presence of TEMPO**
A. Nabifar, N.T. McManus, E. Vivaldo-Lima, L.M.F. Lona and A. Penlidis
Chem Eng. Sci, Acc., 10/08

- 08/021 **An experimental study on the free-radical copolymerization kinetics with crosslinking of styrene and divinylbenzene in supercritical carbon dioxide**
P.R. Garcia-Moran, G.Jaramillo-Soto, M.E. Albores-Velasco,
E. Vivaldo-Lima
Macrom. React. Eng., Acc., 10/08
- 08/022 **Modified frontal polymerization of poly(methyl methacrylate)**
A.G. Villegas, M.A. Ocampo, E. Saldivar-Guerra, B. Garcia-Gaitan,
E. Vivaldo-Lima, G. Luna-Barcenas
JAPS, Acc., 07/08
- 08/023 **Modeling of polymerization kinetics and molecular weight development in the microwave-activated nitroxide-mediated radical polymerization of styrene**
J.J. Hernandez-Meza, G. Jaramillo-Soto, P.R. Garcia-Moran,
J. Palacios-Alquisira and E. Vivaldo-Lima
Macromol. React. Eng., Acc., 12/08

Research Personnel

(SUPERVISOR)

NAME	CAT	DEPT	TD	JD	RD	XF	MG	NMc	AP	LS	JS	PS	CT	THESIS/PROJECT TOPIC	COMPL. DATE
A. Abdullah	2	ChE									X			Mathematical modelling of polymerization with Ziegler-Natta catalysts	Sep 11
M. Achalpurkar	1	ChE				X								Polyelectrolyte membranes	Aug 10
S. Al-Adwani	2	ChE									X			Modelling of catalytic converters	Dec 12
M. Al-Saleh	2	ChE	X								X			Parameter estimation of Ziegler-Natta catalysts using molecular weight and comonomer sequence distribution	Aug 10
A. Al-Shaiban	2	ChE									X			Effect of electron donors on propylene polymerization with Ziegler-Natta catalysts	Sep 11
S. Aliakbari	2	Chem					X							Microencapsulation of drugs	Dec 09
T. Aridi	2	Chem					X							New grafting techniques	Dec 11
H. Aslam	1	Chem		X										Chain dynamics of ruthenium-labeled polylysine probed by fluorescence	Aug 10
Y. Behjat	1	ChE							X					Stress-strain relationships with mol. weight of polymers (with M. Polak (Civ. Eng.))	May 09
S. Chen	2	Chem		X										Characterization of solutions of pyrene end-labelled poly(ethylene oxide) by fluorescence and Rheology	Sep 10
J. Cheng	4	ChE							X					Tensile properties of pipes (with M. Polak (Civ. Eng.))	Sep 09
Y. Choi	2	ChE									X			Synthesis of functional polyolefins	Sep 10
J. Dockendorff	2	Chem					X							Metal-loaded micelles	Dec 09
D. Dorschner	1	ChE	X						X					Modelling multicomponent polymerization	Sep 10
F. Dubbut	4	ChE									X			Modelling of an industrial polymerization process for the production of impact polypropylene copolymers	Jun 11
M. Farooq	2	ChE				X								Waste water treatment by membrane/adsorption	Aug 12
M. Fowler	2	Chem		X										Characterization of the properties of polypeptide aggregates	Sep 11
M. Haque	1	ChE						X	X					Water-soluble polymers	Dec.09
M. Ingratta	2	Chem		X										Synthesis and characterisation by fluorescence of polypeptides	May 09
N. Jacob	1	ChE			X									Non-linear predictive control of an emulsion polymerization reactor	Aug 09
S. Joorabchian	1	CivE			X									Polymer modified concrete	Aug 10
W. Jung	4	ChE	X						X					Modeling and estimation for multicomponent polymerizations	Apr 09
N. Kazemi	1	ChE	X						X					Parameter estimation in terpolymerization	May 10
S. Kim	1	ChE				X								Extraction of Sericin	May 08

1 = MASc 2 = PhD 3 = Postdoctoral Fellow 4 = Res. Associate 5 = Technician
 TD=T.A.Duever JD=J. Duhamel RD=R. Dhib XF=X. Feng MG=M. Gauthier NMc=N. McManus AP=A. Penlidis LS=L. Simon JS=J.B.P. Soares
 PS=Pearl Sullivan CT=C. Tzoganakis

NAME	CAT	DEPT	TD	JD	RD	XF	MG	NMc	AP	LS	JS	PS	CT	THESIS/PROJECT TOPIC	COMPL. DATE
P. Kundu	2	ChE				X								CO ₂ capture from flue gas for greenhouse gas emission control	Aug 12
M. Leung	1	ChE											X	Production scheduling optimization of plastics compounding plant with quality constraints (with A. Elkamel)	Dec 08
W.-Y. Lin	1	Chem					X							Arborescent copolymers as processing additives	Apr 09
T. Liu	1	ChE				X								Gas separation membranes	Feb 09
C. Madhuranthakam	4	ChE							X					Modelling/simulation/optimization of emulsion NBR/SBR systems	May 11
A. Maneshi	2	ChE								X	X			Synthesis and mathematical modelling of clay/polyolefin nanocomposites	Aug 08
B. Matti	1	ChE			X									Optimization of a living polymerization system	Aug 10
S. Mehdiabadi	2	ChE									X			Synthesis and modelling of branched polyolefins with complex structures	Sep 09
M. Meysami	2	ChE											X	Devulcanization of tire rubber crumb with supercritical CO ₂	Sep 11
F. Moingeon	3	Chem					X							Photocatalysts for H ₂ production	Feb 10
G. Moula	2	Chem		X										Characterization of solutions of pyrene labelled hydroxyethylcellulose by fluorescence and rheology	Sep 10
A. Munam	3	Chem					X							Polyisobutylene ionomers	Dec 09
P. Mutyala	2	ChE											X	Production of TPVs from devulcanized rubber crumb	
A. Nabifar	2	ChE						X	X					Multicomponent emulsion polymerization	Sep 11
O. Nguon	2	Chem					X							Polymer chain dynamics	Dec 10
N. Omidbachsh	2 PT	ChE	X											Computer aided product design and development	Apr 09
E. Ortiz	2	ChE											X	Numerical simulations of reactive flows in twin-screw extruders	Apr 10
S. Pirouz	1	ChE									JS			Synthesis of advanced ethylene/1-olefin elastomers with dual metallocene systems	Jan 11
A. Rogalsky	1	ChE										X	X	Mechanical properties of PC/PBT blends (with P. Sullivan)	Dec 09
M. Shaw	2	ChE	X											Fault detection in chemical processes	Aug 11
S.-Y. A. Shin	3	ChE								X	X			In-situ preparation of clay-thermpolastic nanocomposites	Aug 09
H. Siu	2	Chem		X										Fluorescence and rheological studies of surfactant-associative polymers associations	Sept 08
K. Stewart	1	ChE						X	X					Polymeric sensors for detection of toxic vapours	Sep 10
L. Sui	1	ChE											X	Rubber devulcanization and compounding	Dec 08
C. Sun	2	ChE				X								Development of PVDF membranes	Aug 09
H. Tareque	1	ChE											X	PC/PBT Compounding	Aug 09
Z. Ul-Islam	2	ChE			X									Kinetic modelling of hydrosoluble polymers of oxazoline using maghnite-H as catalyst	May 09

1 = MASc 2 = PhD 3 = Postdoctoral Fellow 4 = Res. Associate 5 = Technician

TD=T.A.Duever JD=J. Duhamel RD=R. Dhib XF=X. Feng MG=M. Gauthier NMc=N. McManus AP=A. Penlidis LS=L. Simon JS=J.B.P. Soares

PS=Pearl Sullivan CT=C. Tzoganakis

NAME	CAT	DEPT	TD	JD	RD	XF	MG	NMc	AP	LS	JS	PS	CT	THESIS/PROJECT TOPIC	COMPL. DATE
Y. Wang	1	Chem		X										Correlation between the binding and associative strength of modified PIBSA-based dispersants	Aug 10
I. Washington	4	ChE	X						X					Modeling and optimization of an NBR process	Aug 09
G. Whitton	2	Chem					X							Arborescent polymers form amino acids	Aug 11
Z. Yao	1	ChE				X								Membranes for controlled release	Dec 09
R. Yeetsorn	2	ChE											X	Thermoplastic polymer blends for PEM fuel cells bipolar plates (with Michael Fowler)	Dec 09
J. Yip	1	Chem		X										Study of the aggregation in water of pyrene end-labeled poly(N-isopropylacrylamides)	Aug 10
J. Zhang	1	ChE				X								Hydrogels	Dec 09
M. Zhou	1	ChE						X	X					Unimolecular controlled radical polymerizations	Sep 09
S. Zhu	4	ChE							X				X	Polymer modification aspects	Sep 10

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