

## GENEVIEVE SAUVE

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### Professional Preparation

|   |                     |           |
|---|---------------------|-----------|
| Concordia University  | B.S. Chemistry      | 1994      |
| California Institute of Technology                              | Ph.D. Chemistry     | 1999      |
| Thesis: "Dye Sensitization of Nanocrystalline Titanium Dioxide" |                     |           |
| Advisor: Professor Nathan S. Lewis                              |                     |           |
| Carnegie Mellon University                                      | Conducting Polymers | 2002-2008 |

### Appointments

7/2009-present Assistant Professor  
*Department of Chemistry, Case Western Reserve University, Cleveland, OH*

2008-2009 Visiting Scientist  
*Helmholtz-Centre Berlin for Materials and Energy, Berlin, Germany*

2008-2009 Visiting Assistant Professor  
*Department of Chemistry, Case Western Reserve University, Cleveland, OH*

2005-2008 Research Associate with Professor Richard D. McCullough  
*Department of Chemistry, Carnegie Mellon University, Pittsburgh, PA*

2002-2005 Postdoctoral Fellow with Professor Richard D. McCullough  
*Department of Chemistry, Carnegie Mellon University, Pittsburgh, PA*

1999-2000 Senior Development Chemist  
*PPG Industries, Pittsburgh, PA*

### Current Graduate Students

1. Fernando, Juwanmandadige Roshan Chandraquptha (12/2009-present)
2. Mao, Zhenghao (12/2009-present)
3. Senevirathna, Wasana (12/2010-present)
4. Daddario, Cassie (12/2010-present)

### Current and Past Undergraduate Students

Cassie Daddario (8/2009-5/2010), Quinn M. Gleisner (5/2010-8/2010), Joshua Young (9/2010-6/2011), Margeret Oti (9/2010-6/2011), Xin Hao (01/2011-present), Grace Eder (09/2011-present)

### Postdoctoral Fellows

Dr. Lei Gao (7/2010-present)

### Service and other Synergistic Activities

Member, Resource Committee, 2010-present  
Member, Energy and Materials Faculty Search Committee, 2009-2010

Member, Graduate Admissions Committee, 2009-present  
Member, Chemistry Executive Committee, 2009-2010  
Co-founder, Materials for Opto/electronic Research and Education (MORE) center, CWRU

### Teaching

Fall 2009 CHEM 335: Physical Chemistry 1  
Spring 2010 CHEM 504: Special topics in organic chemistry – Solar energy conversion  
Fall 2010 CHEM 335: Physical Chemistry 1  
Fall 2011 CHEM 335: Physical Chemistry 1

### Reviewing activity

*Proposals:* National Science Foundation (NSF); Office of Basic Energy Sciences (DOE); ACS-PRF  
*Journals:* Langmuir; Macromolecules; Organic Letters; Progress in Polymer Science; Journal of Polymer Science Part B: Polymer Physics; The Journal of Physical Chemistry Letters; Journal of The Electrochemical Society.

### Grants

*Past:* DAAD (German Academic Exchange Service) Faculty Research Visit grant to Germany, 2009

### Awards, scholarships and fellowships

1. Glennan Fellowship, UCITE, Case Western Reserve University, 07/01/2011-06/30/2012.
2. Mentor Fellowship, UCITE, Case Western Reserve University, 07/01/2011-06/30/2012.
3. Max Planck Institute of Colloids and Interfaces Fellowship, 2008
4. Masters and Doctoral Research Scholarships, FCAR (Le Fond Québécois de la Recherche sur la Nature et les Technologies), 1994-1999  
*Scholarship with full tuition awarded to best candidates in continuing graduate work in natural science, mathematics or engineering research.*
5. Dow Chemical Company Travel Fellowship, 1997  
*Awarded to support travel to industrial laboratories.*
6. Chemistry Award, Celanese Canada LTD, 1994  
*Awarded to outstanding students in the chemistry department (one of two).*
7. Merit Award, Society of Chemical Industry, Canadian section, 1994  
*Award in recognition of outstanding academic achievement*
8. Canada Scholarship, 1990-1993  
*Awarded in recognition of sustained academic excellence in science, engineering and technology. Competed nationally.*
9. Entrance Scholarship, Concordia University, 1990-1993.  
*Awarded to the best incoming undergraduate student in chemistry.*

### Publications

1. Gao, L.; Senevirathna, W.; **Sauvé, G.** "Azadipyromethene-Based Conjugated Oligomers with Near-IR Absorption and High Electron Affinity" *Org. Lett.* **2011**, 13, 5354-5357. DOI: 10.1021/ol202211t
2. **Sauvé, G.**; Javier, A. E.; Zhang, R.; Liu, J.; Sydlik, S. A.; Kowalewski, T.; McCullough, R. D. "Well-defined, high molecular weight poly(3-alkylthiophene)s in thin-film transistors: side chain invariance in field-effect mobility" *J. Mater. Chem.*, **2010**, 20, 3195-3201.

3. Osaka, I.; Zhang, R.; **Sauvé, G.**; Smilgies, D.-M.; Kowalewski, T.; McCullough, R. D. "High-Lamellar Ordering and Amorphous-Like p-Network in Short-Chain thiazolothiazole-Thiophene Copolymers Lead to High Mobilities", *J. Am. Chem. Soc.*, **2009**, 131(7), 2521-2529.
4. Liu, J.; Zhang, R.; **Sauvé, G.**; Kowalewski, T.; McCullough, R. D. "Highly Disordered Polymer Field Effect Transistors: N-alkyl dithieno[3,2-b:2',3'-d]pyrroles-based Copolymers with Surprisingly High Charge Carrier Mobilities", *J. Am. Chem. Soc.*, **2008**, 130(39), 13167-13176.
5. Singh, K. A.; **Sauvé, G.**; Zhang, R.; Kowalewski, T.; McCullough, R. D.; Porter, L. M. "Dependence of Field-Effect Mobility and Contact Resistance on Nanostructure in Regioregular Poly(3-hexylthiophene) Thin Film Transistors", *Appl. Phys. Lett.*, **2008**, 92, 263303.
6. Osaka, I.; **Sauvé, G.**; Zhang, R.; Kowalewski, T.; McCullough, R. D. "Novel Thiophene-Thiazolothiazole Copolymers for Organic Field-Effect Transistors", *Adv. Mater.*, **2007**, 19(23) 4160-4165.
7. **Sauvé, G.**; McCullough, R. D. "High Field-Effect Mobilities for Diblock Copolymers of Poly(3-hexylthiophene) and Poly(methyl acrylate)", *Adv. Mater.*, **2007**, 19(14) 1822-1825.
8. Li, B.; Santhanam, S.; Schultz, L.; Jeffries-EL, M.; Iovu, M. C.; **Sauvé, G.**; Cooper, J.; Zhang, R.; Revelli, J. C.; Kusne, A. G.; Snyder, J. L.; Kowalewski, T.; Weiss, L. E.; McCullough, R. D.; Fedder, G. K.; Lambeth, D. N.; "Inkjet Printed Chemical Sensor Array Based on Polythiophene Conductive Polymers", *Sensors and Actuators, B: Chemical*, **2007**, B123, 651-660.
9. Li, B.; **Sauvé, G.**; Iovu, M. C.; Zhang, R.; Cooper, J.; Santhanam, S.; Schultz, L.; Revelli, J. C.; Kusne, A. G.; Kowalewski, T.; Snyder, J. L.; Weiss, L. E.; Fedder, G. K.; McCullough, R. D.; Lambeth, D. N.; "Volatile Organic Compound Detection Using Nanostructured Copolymers", *Nano Lett.*, **2006**, 6 (8) 1598-1602.
10. Zhang, R.; Li, B.; Iovu, M.; Jeffries-EL, M.; **Sauvé, G.**; Cooper, J.; Jia, S.; Tristram-Nagle, S.; Smilgies, D. M.; Lambeth, D. N.; McCullough, R. D.; Kowalewski, T. "Nanostructure Dependence of Field-Effect Mobility in Regioregular Poly(3-hexylthiophene) Thin Film Field Effect Transistors", *J. Am. Chem. Soc.*, **2006**, 128(11), 3480-3481.
11. Jeffries-EL, M.; **Sauvé, G.**; McCullough, R. D. "Facile Synthesis of End-Functionalized Regioregular Poly(3-alkylthiophene)s via Modified Grignard Metathesis Reaction", *Macromolecules*, **2005**, 38(25), 10346-10352.
12. Ewbank, P. C.; Loewe, R. S.; Zhai, L.; Reddinger, J.; **Sauvé, G.**; McCullough, R. D. "Regioregular Poly(thiophene-3-alkanoic acid)s: Water Soluble Conducting Polymers Suitable for Chromatic Chemosensing in Solution and Solid State", *Tetrahedron*, **2004**, 60(49), 11269-11275.
13. Jeffries-EL, M.; **Sauvé, G.**; McCullough, R. D. "In-situ End-group Functionalization of Regioregular Poly(3-alkylthiophene) Using the Grignard Metathesis Polymerization Method", *Adv. Mater.*, **2004**, 16(12), 1017-1019.
14. **Sauvé, G.**; Cass, M. E.; Coia, G.; Doig, S. J.; Lauermaun, I.; Pomykal, K. E.; Lewis, N. S. "Dye Sensitization of Nanocrystalline Titanium Dioxide with Osmium and Ruthenium Polypyridyl Complexes", *J. Phys. Chem. B*, **2000**, 104, 6821-6836.
15. **Sauvé, G.**; Cass, M. E.; Doig, S. J.; Lauermaun, I.; Pomykal, K. E.; Lewis, N. S. "High Quantum Yield Sensitization of Nanocrystalline Titanium Dioxide Photoelectrodes with cis-Dicyanobis(4,4'-dicarboxy-2,2'-bipyridine)osmium(II) or Tris(4,4'-dicarboxy-2,2'-bipyridine)osmium(II) Complexes", *J. Phys. Chem. B*, **2000**, 104, 3488-3491.
16. Kamat, P. V.; **Sauvé, G.**; Guldi, D. M.; Asmus, K.-D. "Radical Reactions of C<sub>84</sub>", *Res. Chem. Intermed.*, **1997**, 23, 575-585.
17. **Sauvé, G.**; Kamat, P. V.; Thomas, K. G.; Thomas, K. J.; Das, S.; George, M. V. "Photochemistry of Squaraine Dyes: Excited Triplet State and Redox Properties of Crown Ether Squaraines", *J. Phys. Chem.*, **1996**, 100(6), 2117-2123.

18. Serpone, N.; **Sauvé, G.**; Koch, R.; Tahiri, H.; Pichat, P.; Piccinini, P.; Pelizzetti, E.; Hidaka, H. "Standardization Protocols of Process Efficiencies and Activation Parameters in Heterogeneous Photocatalysis: Relative Photonic Efficiencies  $\xi_r$ ", *J. Photochem. Photobiol. A: Chem.*, **1996**, 94(2,3), 191-203.
19. **Sauvé, G.**; Kamat, P. V.; Ruoff, R. S. "Excited Triplet and Reduced Forms of  $C_{84}$ ", *J. Phys. Chem.*, **1995**, 99, 2162-2165.
20. **Sauvé, G.**; Dimitrijevic, N. M.; Kamat, P. V. "Singlet and Triplet Excited State Behaviors of  $C_{60}$  in Nonreactive and Reactive Polymer Films", *J. Phys. Chem.*, **1995**, 99, 1199-1203.
21. Serpone, N.; Terzian, R.; Lawless, D.; Kennepohl, P.; **Sauvé, G.** "On the Usage of Turnover Numbers and Quantum Yields in Heterogeneous Photocatalysis", *J. Photochem. Photobiol., A: Chem.*, **1993**, 73(1), 11-16.

### Book chapter

Ewbank, P. C.; Stefan, Mihaela C.; **Sauvé, G.**; McCullough R. D., "Synthesis, characterization and properties of regioregular polythiophene-based materials, in Handbook of Thiophene-based Materials: Applications in Organic Electronics and Photonics", Wiley, **2009**, 157-203.

### Presentations

**Sauvé, G.** "Electron accepting low bandgap conjugated polymers based on azadipyromethene" CERM ACS 2011, Division of the Colloid and Surface Chemistry, Indianapolis, June 10, **2011**; Invited Talk.

**Sauvé, G.**; Gao, L.; Senerivathna W.; "Azadipyromethene (AzaDIPY) as building blocks for low bandgap conjugated polymers" 94<sup>th</sup> Canadian Chemistry Conference and Exhibition, Opto-electronic Materials, June 8, **2011**; Submitted talk.

**Sauvé, G.** "Functional polymers for printable electronic applications", Department of Chemistry and Biochemistry, Denison University, Granville, OH, March 24, **2011**; Invited Talk.

**Sauvé, G.** "Functional polymers for printable electronic applications", Department of Chemistry and Biochemistry, Miami University, Oxford, OH, March 3, **2011**; Invited Talk.

**Sauvé, G.** "Polymeric materials for printable electronic applications: from synthesis to device characterization", Physics Department, Case Western Reserve University, Cleveland, OH, October 25, **2010**; Invited Talk.

**Sauvé, G.** "Polymeric materials for printable electronic applications: from synthesis to device characterization", Department of Macromolecular Science and Engineering, Case Western Reserve University, Cleveland, OH, April 23, **2010**; Invited Talk.

**Sauvé, G.** "Polymeric materials for printable electronic applications: from synthesis to device characterization", Department of Materials Science and Engineering, Case Western Reserve University, Cleveland, OH, March 2, **2010**; Invited Talk.

**Sauvé, G.**, "Block copolymers of poly(3-hexylthiophene): towards better control of nanostructures", *Workshop on Quantum Solar Energy Conversion*, Rauris, Austria, March 12, **2009**; Submitted talk.

**Sauvé, G.**, "Printable Electronics: From Synthesis of Conducting Polymers to High Mobility Transistors", *Nano-Science Center*, University of Copenhagen, Denmark, October 30, **2008**; Invited Talk.

**Sauvé, G.**, "Regioregular poly(3-alkylthiophene)s for use in printable electronic applications: transistors and sensors", *ACS local polymer section*, Pittsburgh, PA, April 22, **2008**; Invited Talk.

**Sauvé, G.**, "Regioregular poly(3-alkylthiophene)s for use in printable electronic applications: transistors and sensors", *PPG Coatings Innovation Center*, Allison Park, PA, Feb. 26, **2008**; Invited Talk.

**Sauvé, G.**, Javier, A.; Stefan, M. C.; Liu, J.; Sydlík, S. A.; Zhang, R.; Kowalewski, T.; McCullough, R. D. "Record High Charge Carrier Mobilities for Well-Defined Regioregular Poly(3-alkylthiophene)s and for

Block Copolymers of Poly(3-hexylthiophene)", *Materials Research Society Spring Meeting*, San Francisco, CA, March 24-28, **2008**; Submitted Poster.

**Sauvé, G.**; McCullough, R. D. "High Mobilities for Block Copolymers of Regioregular Poly(3-hexylthiophene)", *Materials Research Society Spring Meeting*, San Francisco, CA, April 9-13, **2007**; Submitted talk.

**Sauvé, G.**; McCullough, R. D. "High Mobilities for Block Copolymers of Regioregular Poly(3-hexylthiophene)", *233<sup>rd</sup> ACS National Meeting*, Chicago, IL, March 25-29, **2007**; Submitted talk.

**Sauvé, G.**; Zhang, R.; Li, B.; Iovu, M. C.; Craley, C.; Jeffries-EL, M.; Cooper, J.; Jia, S.; Tristram-Nagle, S.; Smilgies, D. M.; Lambeth, D. N.; Kowalewski, T. A.; McCullough, R. D. "Synthesis, mobility, and Conductivity of Well-defined Regioregular Poly(3-hexylthiophene) and Diblock Copolymers of Regioregular Poly(3-hexylthiophene)", *SPIE-Optics and Photonics, Conference 6336 (Organic Field-Effect Transistors V)*, San Diego, CA, August 13-17, **2006**. Submitted Talk.

McCullough, R. D.; **Sauvé, G.**; Li, B.; Jeffries-EL, M.; Santhanam, S.; Schultz, L.; Zhang, R.; Iovu, M. C.; Cooper, J.; Sreedharan, P.; Revelli, J. C.; Kusner, A. G.; Kowalewski, T.; Snyder, J. L.; Weiss, L. E.; Lambeth, D. N.; Fedder, G. K. "Regioregular Polythiophene Nanowires and Sensors", *SPIE-Optics and Photonics, Conference 5940 (Organic Field-Effect Transistors IV)*, San Diego, CA, July 31-August 4, **2005**; Gave Rick McCullough's invited talk.

**Sauvé, G.**; Iovu, M. C.; Jeffries-EL, McCullough, R. D. "Well-Defined Poly(3-hexylthiophene)-*b*-Poly(acrylate) Di-block Copolymers", *Abstracts of Papers, ACS National Meeting*, Washington, DC, August 28-September 1, **2005**. Submitted Poster.

**Sauvé, G.**; Jeffries-EL, M.; McCullough, R. D. "Control of End-groups of Regioregular Poly(3-alkylthiophenes) Using Grignard Metathesis", *Abstracts of Papers, 35<sup>th</sup> Central Regional Meeting of the American Chemical Society*, Pittsburgh, PA, October 19-22, **2003**, Submitted Poster.

**Sauvé, G.**; Jeffries-EL, M.; McCullough, R. D. "Control of End-groups of Regioregular Poly(3-alkylthiophenes) Using Grignard Metathesis", *Abstracts of Papers, 226<sup>th</sup> ACS National Meeting*, New York, NY, September 7-11, **2003**, POLY-401, Submitted Poster.

**Sauvé, G.**; Cass, M.; Coia, G.; Doig, S.; Lewis, N. S. "Studies of Ru and Os Bipyridine Complexes as Sensitizers for Polycrystalline TiO<sub>2</sub>-Based Photoelectrochemical Cells", *216<sup>th</sup> ACS national Meeting*, August 23-27, **1998**. Submitted Talk.