

Xianwen Mao

Postdoctoral Associate
Department of Chemistry and Chemical Biology, Cornell University
Phone: 617-692-0787
Email: xm28@cornell.edu
Website: <https://maoxianwen.wixsite.com/website>

EDUCATION

Massachusetts Institute of Technology, Cambridge, MA
Ph.D. in Chemical Engineering, 2014. Minor in Finance and Economics.
Advisors: T. Alan Hatton, Gregory C. Rutledge

Massachusetts Institute of Technology, Cambridge, MA
M.S. in Chemical Engineering Practice, 2014.

Tsinghua University, Beijing, China
B.S. in Polymer Materials and Engineering, 2008.

RESEARCH APPOINTMENTS

Postdoctoral Researcher

Cornell University, Department of Chemistry and Chemical Biology, P. Chen Research Group, Ithaca, NY (Sep 2016 – present)

- Development of operando imaging techniques for visualizing nonfluorescent processes at super-resolution
- Elucidation of photoelectrochemical energy conversion processes via single-molecule/single-particle analysis

Postdoctoral Researcher

Massachusetts Institute of Technology, Department of Chemical Engineering, T. A. Hatton and G. C. Rutledge Research Groups, Cambridge, MA (Feb 2014 – Aug 2016)

- Electrochemically responsive polymer interfaces for controlling heterogeneous catalysis and surface adsorption
- Interfacial behaviors and electrochemical properties of amphiphilic liquid systems with long-range ordering

Graduate Researcher

Massachusetts Institute of Technology, Department of Chemical Engineering, T. A. Hatton and G. C. Rutledge Research Groups, Cambridge, MA (Jan 2009 – Feb 2014)

- Structural manipulation of polymer-derived carbon electrodes to modulate their electronic properties and electrochemical activities
- Synthesis of redox-responsive polymer gels and modelling of their hydrophilic-hydrophobic transition

Research Intern

National Renewable Energy Lab, Golden, CO (Oct 2009 – Dec 2009)

- Implemented numerical modeling/simulation of biomass gasification processes in fluidized bed reactors.

Technical Consultant

Novartis Vaccine & Diagnostics, Siena, Italy (Aug 2009 – Oct 2009)

- Developed downscale models to optimize lyophilization technologies for commercial vaccines.

Undergraduate Researcher

Tsinghua University, Institute of Polymer Science and Engineering, Y. Huang Research Group, Beijing, China (Jun 2007 – Jun 2008)

- Design and synthesis of pH-sensitive polymer-anticancer drug conjugates via ring-opening metathesis polymerization (ROMP) for tumor targeting.

Research Intern

BASF Co. Ltd., Shanghai, China (Aug 2007)

- Investigated large-scale manufacturing of advanced polymeric materials

Undergraduate Researcher

Tsinghua University, Institute of Polymer Science and Engineering, L. Tang Research Group, Beijing, China (Jun 2006 – Jun 2007)

- Synthesis of block copolymers using RAFT and ATRP techniques, and examination of their self-assembly behavior

Research and Development Intern

Shenma Group Co., Pingdingshan, China. (Jul 2007 – Aug 2007)

- Investigated the technology for large-scale production of polyamide 66.

Process Research Intern

Yansan Petrochemical Co., Beijing, China. (Aug 2006 – Sep 2006)

- Designed and investigated the integrated production network for the phenol-acetone line.

AWARDS AND HONORS

- MIT Water Innovation Prize First Place, 2016
- The Veraqua Prize, MIT, 2016
- American Chemical Society Eastman Chemical Student Award Finalist, 2014
- Skoltech Fellowship, Chemical Engineering, MIT, 2013
- Fiber Society Graduate Student Paper Competition Award First Prize, 2012
- MIT-Harvard Business Case Competition Award Third Prize, 2009
- Bayer Fellowship, Chemical Engineering, MIT, 2008
- Institute Outstanding Graduate Award (top 1% for overall excellence), Tsinghua University, 2008
- BASF Summer Course Best Performance Award, 2007
- Dow Chemical Scholarship (top 5% for overall excellence), Tsinghua University, 2007
- DuPont Scholarship (top 5% for overall excellence), Tsinghua University, 2006
- Dow Chemical Scholarship (top 5% for overall excellence), Tsinghua University, 2005
- National Scholarship for Outstanding Academic Performance, Tsinghua University, 2004
- National Chemistry Olympiad Competition China Gold Metal, 2004

PUBLICATIONS

(* Corresponding author; † Equal contribution)

Work in Progress

29. Liu, C.†; Baral, S.†; **Mao, X.**; Wang, E.; Escobedo, F. A.; Coates, G. W.; Chen, P.*; Tuning single polymer growth via hydrogen bonding in conformational entanglements. *In preparation.*
28. **Mao, X.**; Chen, P.*; Interfacet 2D lateral junction on a 3D particle governs its photoelectrode performance. *In preparation.*
27. **Mao, X.**†; Ye, R.†; Chen, P.*; Single Molecule Fluorescence Microscopy for Characterizations of Heterogeneous Catalysts. ***Springer Handbook of Advanced Catalyst Characterization***. (Invited book chapter). *Submitted.*
26. Genova, L. A.†; Roberts, M. F.†; Wong, Y.-C.; Harper, C. E.; Santiago, A. G.; Fu, B.; Srivastava, A.; Jung, W.; Wang, L. M.; Krzeminski, L.; **Mao, X.**; Sun, X.; Hui, C.-Y.; Chen, P.*; Hernandez, C. J.*; Mechanical stress compromises multicomponent efflux complexes in bacteria. ***Proc. Natl. Acad. Sci. U.S.A.* 2019**. *Under revision.*

Peer-Reviewed Publications

25. Ren, Y.; **Mao, X.**; Hatton, T. A.*; An Asymmetric Electrochemical System with Complementary Tunability in Hydrophobicity for Selective Separations of Organics. ***ACS Cent. Sci.* 2019**, 5 (8), 1396-1406

24. **Mao, X.***; Brown, P.; Červinka, C.; Hazell, G.; Li, H.; Ren, Y.; Chen, D.; Atkin, R.; Eastoe, J.; Grillo, I.; Padua, A. A. H.; Gomes, M. F. C.*; Hatton, T. A.*, Self-assembled nanostructures in ionic liquids facilitate charge storage at electrified interfaces. *Nature Mater.* **2019**, DOI: 10.1038/s41563-019-0449-6.
- Featured in *MIT News*: “New type of electrolyte could enhance supercapacitor performance”.
 - Featured in *MIT Main Page Spotlights* (Aug 14, 2019): “A new class of “ionic liquids” can store several times more energy compared to conventional electrolytes. Using these liquids in certain energy-storage devices could offer major improvements in efficiency, stability, and safety.”
 - Featured in *New York Times*: “Soap, Detergent and Even Laxatives Could Turbocharge a Battery Alternative”.
 - Featured in *UWA News*: “Are laxatives the answer to more powerful mobile phones, cars that run better?”.
 - Featured in *Materials Today*: “Supercapacitors clean up with new ionic liquid electrolyte”.
 - Other news highlight: *SciTechDaily*, *PV Magazine*, *New Zealand Herald*, *University of Bristol News*, *SpaceDaily*, *Phys.org*, *Nanowerk*, *University of Chester News*, *AZO Materials*, *LongRoom News*, *EurekAlert!*, *Institution of Mechanical Engineers News*, *WorldProNews*, *EnergyDaily*, *SciGlow News*, *Mirage News*, *ScienceDaily*, *Innovations Report*, *Industry Update*, etc.
23. **Mao, X.**; Liu, C.; Hesari, M.; Zou, N.; Chen, P.*, Super-resolution imaging of nonfluorescent reactions via competition. *Nature Chem.* **2019**, *11*, 687-694.
- Featured on the front cover of *Nature Chemistry*.
 - Featured in *Cornell Chronicle*: “New imaging method aids in water decontamination”.
 - Featured in *Chem. Eng. News*: “Extending fluorescence microscopy to nonfluorescent reactions”.
 - Featured in *Microscopy and Analysis Editorial*: “Breakthrough imaging of non-fluorescent reactions”.
 - Featured in *Photonics Media*: “Superresolution Imaging Method Aids in Water Decontamination”.
 - Featured in Dutch News platform [C2w]: “Minder zien, meer weten”.
 - Other news highlight: *EurekAlert!*, *Phys.org*, *Nanowerk*, *Newswise*, *ScienceDaily*, *Environmental News Network*, *Azooptics*, *Science360 News*, *Sohu News China*, *Laser Focus World Japan*, etc.
22. Ye, R†; **Mao, X.†**; Sun, X.; Chen, P.*, Analogy between Enzyme and Nanoparticle Catalysis: A Single-Molecule Perspective. *ACS Catal.* **2019**, *9* (3), 1985-1992.
21. Hesari, M.; Sambur, J. B.; **Mao, X.**; Jung, W.; Chen, P.*, Quantifying Photocurrent Loss of a Single Particle–Particle Interface in Nanostructured Photoelectrodes. *Nano Lett.* **2019**, *19* (2), 958-962.
- Featured in *Cornell Chronicle*: “A first: Cornell researchers quantify photocurrent loss in particle interface”.
20. Ren, Y.; Lin, Z.; **Mao, X.**; Tian, W.; Van Voorhis, T.; Hatton, T. A.*, Superhydrophobic, Surfactant-doped, Conducting Polymers for Electrochemically Reversible Adsorption of Organic Contaminants. *Adv. Funct. Mater.* **2018**, *28* (32), 1801466.
19. **Mao, X.**; Tian, W.; Ren, Y.; Chen, D.; Curtis, S. E.; Buss, M. T.; Rutledge, G. C.; Hatton, T. A.*, Energetically efficient electrochemically tunable affinity separation using multicomponent polymeric nanostructures for water treatment. *Energy Environ. Sci.* **2018**, *11* (10), 2954-2963.
18. Zou, N.; Chen, G.; **Mao, X.**; Shen, H.; Choudhary, E.; Zhou, X.; Chen, P.*, Imaging Catalytic Hotspots on Single Plasmonic Nanostructures via Correlated Super-Resolution and Electron Microscopy. *ACS Nano* **2018**, *12* (6), 5570-5579.
17. Hesari, M.†; **Mao, X.†**; Chen, P.*, Charge Carrier Activity on Single-Particle Photo(electro)catalysts: Toward Function in Solar Energy Conversion. *J. Am. Chem. Soc.* **2018**, *140* (22), 6729-6740.
- Featured in *JACS Spotlights*: “Photo(electro)catalysts, ready for their extreme close-up”. *J. Am. Chem. Soc.* **2018**, *140*, 6727-6728.
16. **Mao, X.†**; Liu, A.†; Tian, W.; Wang, X.; Gleason, K. K.*; Hatton, T. A.*, Enhancing Performance Stability of Electrochemically Active Polymers by Vapor-Deposited Organic Networks. *Adv. Funct. Mater.* **2018**, *28* (10), 1706028.

15. **Mao, X.**; Guo, F.; Yan, E. H.; Rutledge, G. C.; Hatton, T. A.*; Remarkably High Heterogeneous Electron Transfer Activity of Carbon-Nanotube-Supported Reduced Graphene Oxide. *Chem. Mater.* **2016**, *28* (20), 7422-7432.
14. **Mao, X.**; Yan, E. H.; Rutledge, G. C.; Hatton, T. A.*; Enhanced Redox Transformation Efficiency in Unconjugated Electroactive Polymer/Carbon Nanotube Hybrids. *Chem. Mater.* **2016**, *28* (2), 543-548.
13. **Mao, X.**; Tian, W.; Hatton, T. A.; Rutledge, G. C.*; Advances in electrospun carbon fiber-based electrochemical sensing platforms for bioanalytical applications. *Anal. Bioanal. Chem.* **2016**, *408* (5), 1307-1326.
12. **Mao, X.**; Yang, X.; Wu, J.; Tian, W.; Rutledge, G. C.*; Hatton, T. A.*; Microwave-Assisted Oxidation of Electrospun Turbostratic Carbon Nanofibers for Tailoring Energy Storage Capabilities. *Chem. Mater.* **2015**, *27* (13), 4574-4585.
11. Tian, W.; **Mao, X.**; Brown, P.; Rutledge, G. C.*; Hatton, T. A.*; Electrochemically Nanostructured Polyvinylferrocene/Polypyrrole Hybrids with Synergy for Energy Storage. *Adv. Funct. Mater.* **2015**, *25* (30), 4803-4813.
10. **Mao, X.**; Hatton, T. A.*; Recent Advances in Electrocatalytic Reduction of Carbon Dioxide Using Metal-Free Catalysts. *Ind. Eng. Chem. Res.* **2015**, *54* (16), 4033-4042.
9. **Mao, X.**; Tian, W.; Wu, J.; Rutledge, G. C.*; Hatton, T. A.*; Electrochemically Responsive Heterogeneous Catalysis for Controlling Reaction Kinetics. *J. Am. Chem. Soc.* **2015**, *137* (3), 1348-1355.
8. **Mao, X.**; Rutledge, G. C.; Hatton, T. A.*; Nanocarbon-based electrochemical systems for sensing, electrocatalysis, and energy storage. *Nano Today* **2014**, *9* (4), 405-432.
7. Wu, J.; Yang, X.; He, Z.; **Mao, X.**; Hatton, T. A.*; Jamison, T. F.*; Continuous Flow Synthesis of Ketones from Carbon Dioxide and Organolithium or Grignard Reagents. *Angew. Chem. Int. Ed.* **2014**, *53* (32), 8416-8420.
6. **Mao, X.**; Yang, X.; Rutledge, G. C.*; Hatton, T. A.*; Ultra-Wide-Range Electrochemical Sensing Using Continuous Electrospun Carbon Nanofibers with High Densities of States. *ACS Appl. Mater. Interfaces* **2014**, *6* (5), 3394-3405.
5. Yang, X.; Wu, J.; **Mao, X.**; Jamison, T. F.*; Hatton, T. A.*; Microwave assisted synthesis of cyclic carbonates from olefins with sodium bicarbonates as the C1 source. *Chem. Comm.* **2014**, *50* (24), 3245-3248.
4. **Mao, X.**; Hatton, T. A.*; Rutledge, G. C.*; A Review of Electrospun Carbon Fibers as Electrode Materials for Energy Storage. *Curr. Org. Chem.* **2013**, *17* (13), 1390-1401.
3. **Mao, X.**; Rutledge, G. C.*; Hatton, T. A.*; Polyvinylferrocene for Noncovalent Dispersion and Redox-Controlled Precipitation of Carbon Nanotubes in Nonaqueous Media. *Langmuir* **2013**, *29* (31), 9626-9634.
2. **Mao, X.**; Simeon, F.; Achilleos, D. S.; Rutledge, G. C.*; Hatton, T. A.*; Metallocene/carbon hybrids prepared by a solution process for supercapacitor applications. *J. Mater. Chem. A* **2013**, *1* (42), 13120-13127.
1. **Mao, X.**; Simeon, F.; Rutledge, G. C.*; Hatton, T. A.*; Electrospun Carbon Nanofiber Webs with Controlled Density of States for Sensor Applications. *Adv. Mater.* **2013**, *25* (9), 1309-1314.

PATENTS

6. Hatton, T. A.; **Mao, X.**; Ren, Y.; An asymmetric electrochemical system with complementary tunability in hydrophobicity for selective separations of organics. U.S. Provisional Application No. 62/871,520. Filed July 8, 2019.
5. Chen, P.; **Mao, X.**; A competition-enabled imaging technique with super-resolution. U.S. Provisional Application No. 62/737,195. Filed September 27, 2018.

4. Hatton, T. A.; **Mao, X.**; Brown, P.; Gomes, M. F. C.; High-temperature supercapacitors containing surface active ionic liquids. U.S. Patent Application No. 16/323,468. Filed February 5, 2019.
3. Liu, A.; Gleason, K. K.; Hatton, T. A.; **Mao, X.**; Enhancing performance stability of electroactive polymers by vapor-deposited organic networks. U.S. Patent Application No. 16/036,010. International Patent Application No. PCT/US2018/042231. Filed July 16, 2018.
2. **Mao, X.**; Tian, W.; Ren, Y.; Rutledge, G. C.; Hatton, T. A.; Adsorbents, systems, and methods for separation of organic species from water. U.S. Patent Application No. 16/024,493. International Patent Application No. PCT/US2018/040444. Filed June 29, 2018.
1. Hatton, T. A.; **Mao, X.**; Rutledge, G. C.; Tian, W.; Wu, J.; Electrochemically responsive composites of redox polymers and conducting fibers. U.S. Patent Application No. 14/942,221. International Patent Application No. PCT/US2015/060873. Filed November 16, 2015.

TEACHING EXPERIENCE

Massachusetts Institute of Technology, Department of Chemical Engineering

Chemical Engineering Projects Laboratory (MIT Course # 10.26/27/29) Technical Consultant for Prof Patrick S. Doyle (Jan 2015 – May 2015)

- Planned and held weekly workshops for a group of three undergraduates on the project of electrochemically responsive heterogeneous catalysis.
- Supervised lab work two sessions per week (8 hr/week).
- Obtained hands-on practice in effective teaching: course planning, lecturing, active learning, assessment of learning.

Massachusetts Institute of Technology, Department of Chemical Engineering

Chemical Reactor Engineering (MIT Course # 10.65) Teaching Assistant for Prof. Michael S. Strano and Prof. Hadley D. Sikes (Jan 2012 – May 2012)

- Full-time teaching assistant for the graduate-level MIT ChemE core course on reacting engineering for a class of 47 graduate students.
- Helped prepare course materials, problem sets, quizzes, midterm and final exams.
- Held weekly office hours (4 hr/week) to help students individually with questions and concepts encountered during class and in problem sets/exams.
- Held lectures on the use of COMSOL and Gaussian.
- Held review sessions for midterm and final exams.
- Graded exams and problem sets (with the help of four other graders).

Tsinghua University, Institute of Polymer Science and Engineering

Teaching Assistant for the Organic Chemistry Lab (Sep 2007 – Dec 2007)

- Helped prepare the lab section of the organic chemistry course for a class of 27 undergraduate students.
- Conducted review sessions and led discussions on lab report preparation and technical writing for chemical sciences.

MENTORING EXPERIENCE

Cornell University, Department of Chemistry and Chemical Biology

Research mentor for postdoctoral researcher Rong Ye (Mar 2018 – Present)

- Rong Ye obtained his PhD in Chemistry from UC Berkeley and now is a postdoctoral researcher in the Peng Chen group at Cornell.
- Collaboration projects: “COMPEITS imaging on metal catalysis” and “polymer growth dynamics at single-monomer resolution”.

Research mentor for graduate student Zhiheng Zhao (Aug 2019 – present)

- Zhiheng Zhao obtained his BS degree in Biomedical Engineering from UC Berkeley, and now is a PhD student in the Peng Chen group at Cornell.
- Collaboration projects: “charge carrier chemical imaging on catalyst-modified semiconductor nanostructures” and “multimodal performance metric imaging for bioenergy conversion”.

Massachusetts Institute of Technology, Department of Chemical Engineering

Research mentor for graduate student Wenda Tian (Jan 2013 – Sep 2016)

- Wenda Tian obtained her BS degree in Chemical Engineering from UC Berkeley and her PhD in Chemical Engineering from MIT Hatton/Rutledge groups, and now is a management consultant at McKinsey & Company (San Francisco).
 - This student co-authored 7 manuscripts with me: *Adv. Funct. Mater.* 2018, 28 (32), 1801466; *Energy Environ. Sci.* 2018, 11 (10), 2954-2963; *Adv. Funct. Mater.* 2018, 28 (10), 1706028; *Anal. Bioanal. Chem.* 2016, 408 (5), 1307-1326; *Chem. Mater.* 2015, 27 (13), 4574-4585; *Adv. Funct. Mater.* 2015, 25 (30), 4803-4813; *J. Am. Chem. Soc.* 2015, 137 (3), 1348-1355.
- Research mentor for graduate student Yinying Ren (Jan 2015 – Sep 2016)
- Yinying Ren obtained her BS degree in Chemical Engineering from Northwestern University and her PhD in Chemical Engineering from MIT Hatton group, and now is a management consultant at McKinsey & Company (Shanghai).
 - This student co-authored 4 manuscripts with me: *Nature Mater.* 2019, DOI: 10.1038/s41563-019-0449-6; *ACS Cent. Sci.* 2019, 5 (8), 1396-1406; *Adv. Funct. Mater.* 2018, 28 (32), 1801466; *Energy Environ. Sci.* 2018, 11 (10), 2954-2963.

Massachusetts Institute of Technology, Department of Chemical Engineering

Research mentor for undergraduate research interns

Name	Time	Then
James Hedrick	Jan 2013 – May 2013 (40 hr/week)	MIT, Chemical Engineering
Esther Yan	May 2013 – Aug 2014 (12 hr/week)	Boston University, Chemistry & Economics
Raef Zebian	July 2014 – Sep 2014 (40 hr/week)	American University of Beirut, Chemistry
Jennifer Subler	Dec 2014 – Aug 2015 (12 hr/week)	MIT, Chemical Engineering
Anne Dunn	Jan 2015 – May 2015 (12 hr/week)	MIT, Materials Science & Engineering
Videh Seksaria	Jan 2015 – Aug 2015 (12 hr/week)	MIT, Chemical Engineering
Brook Eyob	Jan 2015 – Aug 2015 (12 hr/week)	MIT, Chemical Engineering
Leah Schmitz	Jan 2015 – May 2015 (12 hr/week)	MIT, Chemical Engineering
Barbara Lima	Jan 2015 – May 2015 (12 hr/week)	MIT, Chemical Engineering
Arica Wyche	Jan 2015 – May 2015 (12 hr/week)	MIT, Chemical Engineering
Grecia Monsalve	Jul 2015 – Aug 2015 (40 hr/week)	Imperial College London, Chemistry
Tarek Lahoud	Jun 2015 – Aug 2015 (40 hr/week)	American University of Beirut, Chemistry
Dexin Chen	Jan 2015 – Jun 2016 (12 hr/week)	MIT, Materials Science & Engineering
Ayomide Fatunde	Sep 2015 – Dec 2015 (12 hr/week)	MIT, Chemical Engineering
Phuong Pham	Sep 2015 – Dec 2015 (12 hr/week)	MIT, Chemical Engineering
Sarah Curtis	Sep 2015 – Jun 2016 (12 hr/week)	MIT, Chemical Engineering

PRESENTATIONS

(Contributed presentations are many, and are not listed here)

- Invited Oral Presentation: “Chemical Imaging of Single-Particle Photoelectrocatalysis for Energy Conversion”, **Mao, X.**; Hesari, M.; Zou, N.; Chen, P.; ECS Annual Meeting, Seattle, WA, May 2018.
- Oral Presentation: “Electrospun Carbon Nanofibers for Electrochemical Biosensing and Energy Storage”, **Mao, X.**; Tian, W.; Wu, J.; Hatton, T. A.; Rutledge, G. C.; Fiber Society Fall Conference, Ithaca, NY, October 2016.
- Invited Oral Presentation: “Electrospun Fibers for Electrochemical Analysis”, **Mao, X.**; Zhang, Y. X.; Hatton, T. A.; Tuller, H. L.; Rutledge, G. C.; PITTCON Conference&Expo, Atlanta, GA, March 2016.
- Invited Oral Presentation: “Rational Design of Functional Electrochemical Interfaces”, **Mao, X.**; Rutledge, G. C.; Hatton, T. A.; Department of Chemical and Biomolecular Engineering, University of California Los Angeles, Los Angeles, CA, February 2016.
- Oral Presentation, “Nanostructured surfactant ionic liquids with unusually high capacitances for high-temperature flexible supercapacitors”, **Mao, X.**; Brown, P.; Gomez, M.; Rutledge, G. C.; Hatton, T. A.; AICHE Annual Meeting, Salt Lake City, UT, November 2015.

- Oral Presentation, “Electrochemical Control over Reaction Kinetics Using Rationally Designed Redox-Switchable Catalysts”, **Mao, X.**; Tian, W.; Wu, J.; Rutledge, G. C.; Hatton, T. A.; AICHE Annual Meeting, Salt Lake City, UT, November 2015.
- Oral Presentation, “Hybrid Electrochemical Interfaces for Control over Separation and Catalytic Processes”, **Mao, X.**; Tian, W.; Wu, J.; Rutledge, G. C.; Hatton, T. A.; Capacitive Deionization and Electrosorption (CDI&E) Conference, Saarbrücken, Germany, October 2015.
- Invited Oral Presentation: “Rational Design of Functional Electrochemical Interfaces”, **Mao, X.**; Rutledge, G. C.; Hatton, T. A.; Department of Chemical and Biomolecular Engineering, University of Melbourne, Melbourne, Australia, October 2015.
- Oral Presentation, “Surfactant ionic liquids with unusually high capacitances for high-temperature flexible supercapacitors”, **Mao, X.**; Brown, P.; Gomez, M.; Rutledge, G. C.; Hatton, T. A.; ACS National Meeting, Boston, MA, August 2015.
- Oral Presentation, “Unusually high heterogeneous electron transfer activity of carbon nanotube-supported reduced graphene oxide”, **Mao, X.**; Guo, F.; Yan, Esther H.; Rutledge, G. C.; Hatton, T. A.; ACS National Meeting, Boston, MA, August 2015.
- Oral Presentation, “Redox Polymer/Carbon Fiber Hybrids for Electrochemically Responsive Heterogeneous Catalysis”, **Mao, X.**; Tian, W.; Wu, J.; Rutledge, G. C.; Hatton, T. A.; ACS National Meeting, Boston, MA, August 2015.
- Poster Presentation, “Redox Polymer/Carbon Hybrid Structures with Controlled Electrochemical Properties”, **Mao, X.**; Tian, W.; Su, X.; Rutledge, G. C.; Hatton, T. A.; MIT PPST Polymer Day, Cambridge, MA, March 2015.
- Poster Presentation, “Redox Polymer-Based Porous Materials for Electrochemically Responsive Organics/Water Separation and Capacitive Deionization”, **Mao, X.**; Tian, W.; Su, X.; Rutledge, G. C.; Hatton, T. A.; MIT Water Night, Cambridge, MA, March 2015.
- Oral Presentation: “Reduced Graphene Oxide/Carbon Nanotube Hybrids with Tunable Electronic Structure for Sensing Applications”, **Mao, X.**; Guo, F.; Yan, E. H.; Rutledge, G. C.; Hatton, T. A.; MRS Fall Meeting, Boston, MA, December 2014.
- Poster Presentation: “Microwave-Assisted Oxidation of Electrospun Turbostratic Carbon Nanofibers for Tailoring Energy Storage Capabilities”, **Mao, X.**; Rutledge, G. C.; Hatton, T. A.; MITEI Annual Research Conference, Cambridge, MA, November 2014.
- Oral Presentation: “Electrochemically Responsive Heterogeneous Catalysis for Controlling Reaction Kinetics”, **Mao, X.**; Tian, W.; Wu, J.; Rutledge, G. C.; Hatton, T. A.; AICHE Annual Meeting, Atlanta, GA, November 2014.
- Invited Oral Presentation: “Polymer-Derived Electrospun Turbostratic Carbon Nanofibers with Controlled Electrochemical Activities for Sensing and Energy Applications”, **Mao, X.**; Rutledge, G. C.; Hatton, T. A.; ACS National Meeting, San Francisco, CA, August 2014.
- Poster Presentation: “Redox Polymer/Carbon Hybrids with Controlled Electrochemical Properties for Pseudo-Capacitive Deionization”, **Mao, X.**; Simeon, F.; Achilleos, D. S.; Rutledge, G. C.; Hatton, T. A.; MIT Water Night, Cambridge, MA, March 2014.
- Poster Presentation: “Microwave-Assisted Oxidation of Turbostratic Carbon Nanofibers for Tailoring Energy Storage Capabilities”, **Mao, X.**; Yang, X. Q.; Wu, J.; Tian, W.; Rutledge, G. C.; Hatton, T. A.; MRS Fall Meeting, Boston, MA, December 2013.
- Oral Presentation: “Ultrawide-Range Electrochemical Biosensing Using Electrospun Carbon Nanofibers with High Density of States”, **Mao, X.**; Yang, X. Q.; Rutledge, G. C.; Hatton, T. A.; AICHE Annual Meeting, San Francisco, CA, November 2013.
- Poster Presentation: “Metallocene/Carbon Hybrids Prepared by A Solution Process for Supercapacitor Applications”, **Mao, X.**; Simeon, F.; Achilleos, D. S.; Rutledge, G. C.; Hatton, T. A.; MIT PPST Polymer Day,

Cambridge, MA, March 2013.

- Oral Presentation: “Redox Polymer/Carbon Nanotube Hybrids with Tunable Nanostructures and Electrocapacitive Performance”, **Mao, X.**; Simeon, F.; Achilleos, D. S.; Rutledge, G. C.; Hatton, T. A.; MRS Fall Meeting, Boston, MA, December 2012.
- Invited Oral Presentation: “Electrospun Carbon Nanofiber Webs with Controlled Density of States for Sensor Applications”, **Mao, X.**; Simeon, F.; Rutledge, G. C.; Hatton, T. A.; Fiber Society Fall Conference, Boston, MA, November 2012.
- Oral Presentation: “The Electrocapacitive Properties of Organometallic Polymer/Multiwalled Carbon Nanotube Hybrids”, **Mao, X.**; Simeon, F.; Achilleos, D. S.; Rutledge, G. C.; Hatton, T. A.; AIChE Annual Meeting, Pittsburgh, PA, November 2012.
- Oral Presentation: “Electrochemical Activity and Biosensitivity of Free-Standing Electrospun Carbon Nanofiber Webs”, **Mao, X.**; Simeon, F.; Rutledge, G. C.; Hatton, T. A.; IUPAC World Polymer Congress, Blacksburg, VA, June 2012.
- Poster Presentation: “Free-Standing Electrospun Carbon Nanofiber Webs for Electrochemical Sensing Applications”, **Mao, X.**; Simeon, F.; Rutledge, G. C.; Hatton, T. A.; MIT PPST Polymer Day, Cambridge, MA, March 2012.
- Oral Presentation: “Redox-Responsive Polymeric Gels for Electrochemically Mediated Organics-Water Separation”, **Mao, X.**; Akhoury, A.; Rutledge, G. C.; Hatton, T. A.; MIT DMA Annual Meeting, Cambridge, MA, May 2011.

JOURNAL REVIEWING

Ad hoc manuscript peer review for *Adv. Funct. Mater.*, *Adv. Energy Mater.*, *Angew. Chem. Int. Ed.*, *ACS Appl. Mater. Interfaces*, *Macromolecules*, *Carbon*, *J. Power Sources*, *J. Mater. Sci.*, *Adv. Mater. Interfaces*, *J. Colloid Interface Sci.*, *ACS Sensors*, *ACS Sustainable Chem. Eng.*, *Physical Chemistry Chemical Physics*, *Chemical Engineering Journal*, etc.

REFERENCES

Prof. T. Alan Hatton

Ralph Landau Professor of Chemical Engineering
Director, David H. Koch School of Chemical Engineering Practice
Department of Chemical Engineering, Massachusetts Institute of Technology
Email: tahatton@mit.edu
Prof. Hatton is my Ph.D. advisor.

Prof. Gregory C. Rutledge

Lamot du Pont Professor of Chemical Engineering
Department of Chemical Engineering, Massachusetts Institute of Technology
Email: rutledge@mit.edu
Prof. Rutledge is my Ph.D. co-advisor.

Prof. Peng Chen

Peter J. W. Debye Professor of Chemistry
Department of Chemistry and Chemical Biology, Cornell University
Email: pc252@cornell.edu
Prof. Chen is my postdoctoral advisor.