

Mingtao Chen

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EDUCATION

Sep.2013-Current **PhD Candidate in Chemistry**

Virginia Polytechnic Institute and State University, Blacksburg, VA

Department of Chemistry

Advisor: Dr. Timothy E. Long

Sep. 2011-May.2013 **M.S., in Chemistry**

Polytechnic Institute of New York University, New York, NY

Department of Chemistry

Advisor: Dr. Richard Gross

Sep. 2007-July.2011 **B.S., Pharmaceutical Engineering**

East China University of Science and Technology, China

Department of Pharmacy

Advisor: Dr. Weiping Deng

RESEARCH EXPERIENCE

RESEARCH IN POLYMER SCIENCE

Dec.2013-Present

- **Fundamental understanding of electromechanical responsive materials.** Novel synthesis of block copolymers with imidazolium-containing soft block and deuterated styrene hard block. Investigated the influence of different counter ions on the kinetics of the radical polymerization of imidazolium-containing homopolymers and block

copolymers. Studied the conductivity, thermomechanical properties and morphology of homopolymers and block copolymers. Employed neutron reflectometry to probe the morphological change of block copolymer thin films under external electric field.

- **Anionic Polymerization of 4-vinylbenzyl piperidine based charged block copolymers.** *Synthesized 4-vinylbenzyl piperidine (4VBP) containing diblock and triblock copolymers. Studied the influence of 4VBP segments on isoprene block's microstructure. Alkylated the piperidine amine in 4VBP block to yield charged block copolymers and anion exchange of the charged polymers. Investigated thermomechanical and rheological properties' difference between neutral and charged BCPs.*
- **Reversible addition-fragmentation chain transfer polymerization of urea containing ABA triblock copolymers.** *Developed a series of side chain urea containing ABA triblock copolymers as a model to study the hydrogen bonding of urea groups on polymer side chains. Urea groups on the side chains afforded less order hydrogen bonding structure, but the hydrogen bonding maintained over a longer temperature range than that from urea groups along polymer backbone. Created various ordered surface morphology using hydrogen bonding BCPs.*
- **Michael reactions for next generation adhesives.** *Studied the potential to use crosslinking system generated from Michael reactions as novel active adhesives. Screened solvent compatibility on different surface using contact angles. Investigated and optimized the gelation time and mechanical strength of Michael reaction networks by changing molecular weight, amount of catalyst and catalyst type.*

RESEARCH IN POLYMER SCIENCE

Feb.2012-May.2013

- **Bio-based unsaturated lipid polymers and its cell compatibility study.** *Purified and enzymatically modified fatty acid from fermentation as the monomers for further polymerization. Synthesized poly(sophorolipid) homopolymers or copolymers using ROMP. Studied the mechanical properties and cell viability of various modified poly(sophorolipid) polymers.*
- **Surfactant property and anti-bacteria studies of poly(sophorolipid).**

RESEARCH IN BIOCHEMISTRY

Dec.2010-Jun.2011

- **Cultivation and transplant of mice spleen cells (graduation paper).**
- Plasmid extraction, Western Blot, DNA electrophoresis and drug precursors activity test (work as volunteer).

RESEARCH IN ORGANIC CHEMISTRY

Jun.2010-Dec.2010

- Chiral synthesis based on Isatin and Methyl 2-(diphenylmethyleneamino)acetate.
- Optimization of reaction condition, such as, chiral catalyst, ligand, solvent, temperature and addition.

Award

2016 June 12th National Graduate Research Conference oral presentation award

2011-2013 Student Fellowship

2007-2011 Outstanding Student Scholarship

Publications

1. Schultz, A. R.; Fahs, G. B.; Jangu, C.; Chen, M. T.; Moore, R. B.; Long, T. E. *Chem. Commun.* **2016**, 52, 950-953.
 2. Peng, Y. F.; Munoz-Pinto, D. J.; Chen, M. T.; Decatur, J.; Hahn, M.; Gross, R. A. *Biomacromolecules* **2014**, 15, 4214-4227.
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Conference presentation

- **2016 12th National Graduate Research Conference:** Urea-Containing ABA Triblock Copolymers from RAFT Polymerization: High Glass Transition Segments for Thermoplastic Elastomers
 - **2015 ACS Boston:** *Urea-containing ABA triblock copolymers from RAFT polymerization: High glass transition segments for thermoplastic elastomers.*
 - **2015 ACS Boston:** *Living anionic polymerization of 4-vinylbenzyl piperidine ABC triblock copolymers thermoplastic elastomers.*
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Technical Experience

- High Performance Liquid Chromatography
- Gas Chromatography-Mass Spectrometry
- Time-of-fly Mass Spectrometry
- Dynamic Light Scattering
- Differential scanning calorimetry
- Thermogravimetric Sorption Analyzer & Thermogravimetric Analysis
- Dynamic mechanical analysis
- In-situ FTIR
- Size exclusive chromatography
- Atomic force microscopy

- Rheology
 - Nuclear magnetic resonance spectroscopy
 - Scanning electron microscopy
 - Spin coater
 - Ellipsometry
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References

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- **Dr. Robert B. Moore**
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