

Qining Sun

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Research of Interest

Forestry bioproducts development and characterization; Synthesis of adhesive and measurement of resin properties; Bioconversion of lignocellulosics to fermentable sugars; Green film and foam preparation from cellulose, hemicelluloses and lignin; Lignin carbon fiber production; Paper coating and packaging.

Education background

2011 – Dec. 2014 expected	Ph.D. Candidate, School of Chemistry and Biochemistry, Georgia Institute of Technology Major: Organic Chemistry--Paper Science Engineering Advisor: Art J. Ragauskas Current GPA:3.70/4.00
2006 – 2009	M.E., Wood Science and Technology Chinese Academy of Forestry Advisor: Tefu Qin
2002 - 2006	B. E., Chemical Engineering and Technology DeZhou University Advisor: Guanjie Zhai

Research and internship experiences

2011.1– Dec. 2014 expected, PhD Candidate
School of Chemistry and Biochemistry, Institute of Paper Science and Technology, Georgia Institute of Technology Supervisor: Professor Art J. Ragauskas

- Chemical structure and composition analysis of biomass; Leading pretreatments for biofuel production; Bioconversion of lignocellulosics to fermentable sugars
- Novel biofilms preparation from poplar nanocellulose whiskers, xylan and crosslinkers; High-quality carbon fibers production from lignin

2013.5 – 2013.8, Research Technician—Graduate Co-op/Internship Program
BASF Technical Center, Middle Georgia Supervisor: Dr. Rajan Iyer

- Develop novel sustainable materials for paper coating and packaging
- Kaolin clay catalyst development and utilization

2009.8 – 2010.12, Research Assistant
School of Renewable Natural Resources, Louisiana State University. Supervisor: Professor Todd F. Shupe

- Improvement of melamine-urea-formaldehyde (MUF) resins for bonding Southern Pine Particleboard; Measurement of resin properties and bonding performance

2009.8 – 2010.8, Research Assistant
USDA-Forest Service Alexandria Forestry Center, Pineville, Louisiana. Supervisor: Dr. Chung-Yun Hse

- Synthesis of melamine modified urea-formaldehyde (UFM) resin with different catalysts; Investigating reaction mechanism, resin curing behavior and thermal properties;
- Liquefaction of wood to adhesive and foam; Preparation of novel wood fire retardants

2006.9 – 2009.7, Graduate Research Assistant
Research Institute of Wood Industry, Chinese Academy of Forestry. Supervisor: Professor Tefu Qin

- Characterization and analysis of brown-rotted wood and ball milled lignin structure;
- Development of MUF resin and resin powder via spray-drying technology
- Modification of brown-rotted wood to prepare environmentally-friendly resin

Coursework and Related Skills

Physical Organic Chem, Organic Compounds, Organic Synthesis, Organic Chem-Introduction to Mechanisms, Biorenewable Polymers, Pulp and Paper Manufacture I & II, ChemE Process Pulp Paper, Statistical Techniques.

Language C, Adobe PhotoShop, Origin, Chem3D draw; NMR techniques: ³¹P NMR, ¹³C NMR, ¹H NMR, HSQC, DEPT and solid state NMR; Analytical chromatography: GC-MS, HPLC, FTIR, UV/Vis, GPC, DSC, TGA, SEM, XRD and HPAEC-PAD.

Leadership

- **Treasurer**, Technical Association of the Pulp and Paper Industry (TAPPI)--Graduate Chapter. 2012-

2013.

- **Vice President**, TAPPI--Graduate Chapter. 2011-2012.

Honors and awards

- Invited peer-reviewer for Cellulose Chemistry and Technology-Journal- Academia Republicii Socialiste România (2014-present)
- Invited peer-reviewer for Carbohydrate Polymers - Journal – Elsevier (2013-present)
- Institute of Paper Chemistry Foundation (IPCF) Innovation Award at 2013 Georgia Tech Research & Innovation Conference, TOP Award in paper chemistry and forestry bioproducts research field, 1st prize around 350 graduate students (2013)
- Paper Science and Engineering Fellowship Recipient (2011-2015)
- The 2nd Liangxi Forestry Excellent Student Prize, by Chinese Society of Forestry, China's HIGHEST Honor in Forestry Science Field (2009)
- Outstanding Academic Performance Scholarship, by Dezhou University (2005 – 2006)
- All-round Student Prize, by Dezhou University (2003 – 2004)

Publications-- Journal articles and book chapters

- **SUN Q**, QIN Te-fu, LI Gai-yun. Progress on Activation and Application to Wood Adhesives of Lignin. Chinese Polymer Bulletin. 2008, 9:55-60.
- **Q SUN**, Te-Fu QIN, Gai-Yun LI. Studies on Chemical Groups Characteristics in MWLs of Normal and Brown-rotted Pinus Massoniana. Spectroscopy and Spectral Analysis (Supplement). 2008, 28(10):417-418.
- **Q SUN**, Gai-Yun Li and Te-Fu Qin. Chemical Groups and Structural Characterization of Brown-rotted Pinus Massoniana Lignin. International Journal of Polymer Analysis and Characterization. 2009, 14:1-15.
- Li Gai-yun, **Sun Q**, Qin Te-fu and Huang Luo-hua. Effect of Reduction by Sodium Borohydride on the structural Characteristics of Brown-Rotted Lignin. Spectroscopy and Spectral Analysis. 2010, 30 (07): 1930-1933.
- **Q Sun**, Chung-Yun Hse, Todd F. Shupe. Characterization and Performance of Melamine Enhanced Urea Formaldehyde Resin for Bonding Southern Pine Particleboard. Journal of Applied Polymer Science. 2011, 119 (6): 3538-3543.
- Nicolas Brosse, Anthony Dufour, Xianzhi Meng, **Q Sun** and Arthur Ragauskas. Miscanthus: a fast-growing crop for biofuels and chemicals production. Biofuels, Bioproducts & Biorefining. 2012 6(5):580-598.
- Marcus Foston, Lex Nunnery, Xianzhi Meng, **Q Sun**, Fredrick S. Baker and Art Ragauskas. NMR a critical tool to study the production of carbon fiber from lignin. Carbon. 2013, 52: 65-73.
- Wenjia Han, Chuanshan Zhao, **Q Sun**, Rendang Yang and Dongmei Yu. Modification of Bleached Bamboo Fiber using Cationic Guar Gum for Fiberboard. Bioresources. 2013,8(3): 4421-4428.
- Allison Tolbert, Alyse M.E. Ragauskas, Hannah Akinosho, Fan Hu, Tyrone Wells, **Q Sun**, Xianzhi Meng, Art J. Ragauskas. A 'Twitter' Generation Perspective on Biorefining. Biofuels, Bioproducts & Biorefining. 2013. 7. DOI: 10.1002/bbb.1459
- **Q Sun**. Enzymatic Deconstruction of Lignocellulose to Fermentable sugars. In: Materials for Biofuels. 2014. <http://www.worldscientific.com/worldscibooks/10.1142/8835>
- Tao Ma, Matyas Kosa, **Q Sun**. Fermentation to Bioethanol/Biobutanol. In: Materials for Biofuels. 2014. <http://www.worldscientific.com/worldscibooks/10.1142/8835>
- Zhaoyang Xu, **Q Sun**, Fang Huang, Yunqiao Pu, Shaobo Pan and Arthur J. Ragauskas. Preparation and Characteristics of Cellulose Nanowhisker Reinforced Acrylic Foams Synthesized by Freeze-casting. RSC Advances. 2014.
- **Q Sun**, Chung-Yun Hse, Todd F. Shupe. Effect of Different Catalysts on UFM Resin Synthesis. Journal of Applied Polymer Science. 2014.
- **Q Sun**, Marcus Foston, Daisuke Sawada, Sai Venkatesh Pingali, Hugh M. O'Niell, Hongjia Li, Charles E. Wyman, Paul Langan, Art J. Ragauskas. Comparison of Changes in Cellulose Ultrastructure during Different Pretreatments of Poplar. Cellulose. 2014.

Publications—Under review or in progress

- **Q Sun.** Thermal Behavior and Chemical Characterization of UMF Resin with Different Catalysts.
- **Q Sun,** et al. The Effect of Lignin Content on Changes that Occur in Poplar Cellulose Ultrastructure during Dilute Acid Pretreatment.
- **Q Sun** et al. Preparation and Characterization of Biofilms from Poplar Nanocellulose Whiskers and Hemicelluloses.
- Effect of D₂O on growth properties and chemical structure of annual ryegrass (*Lolium multiflorum*)
- Thermogravimetric Properties of Ultrasonicated Lignoboost Lignin

Patents, conference proceedings & presentations

- **Q Sun.** Art Ragauskas. Xylan Reinforcement on Poplar Cellulose Nanowhiskers films. Presentation at 2013 TAPPI Executive Conference, April 18-19, 2013.
- **Q Sun,** Chung-Yun Hse, Todd F. Shupe. Effects of Four Catalysts on Melamine-Urea-Formaldehyde Resin Structure and Performance of Particleboard. Poster at Forest Products Society 64th International Convention in Madison, Wisconsin, USA Jun 20-22, 2010.
- Li Gai-yun, Qin Te-fu, Huang Luo-hua, **Sun Q.** Adhesive using waste brown-rotten wood and plywood therewith. Patent Application Number: CN 200910086669.6.
- **SUN Q,** QIN Te-fu, LI Gai-yun. Study on characteristic change of lignin of pre-and post-decayed *Pinus Massoniana* by brown-rot fungi. 2nd National Conference on Biomass Material Science and Technology in China. 2008. 270-276
- **Sun Q.** Research on the Developing Orientation of Chinese Forest Products Industry. Proceedings of the Function and Role of Forest Products Industry in National Economy. 2007.

News and events

- http://www.ipst.gatech.edu/faculty/ragauskas_art/news_articles/GTRIC%20AWARD%20from%20Qining%20Sun.pdf
- http://ipst.gatech.edu/news/current/130423_qining_sun.html
- http://www.ipst.gatech.edu/news/current/130218_gtric.html
- <http://www.criwi.org.cn/rbw/new.asp?newsId=7253>
- <http://lxh.forestry.gov.cn/portal/lxh/s/1399/content-131771.html>
- <http://www.google.com/patents/CN101921574B?cl=zh>
- <http://211.157.104.87:8080/sipo/zljs/hyjs-yx-new.jsp?recid=200910086669.6>

References

References available upon request