Fangming Xiang

Department of Energy ♦ National Energy Technology Laboratory ♦ 626 Cochrans Mill Road, Pittsburgh, PA 15236
Office Phone: (412) 386-5974 ♦ Email: fangming.xiang@netl.doe.gov

Education

ORISE Postdoctoral Fellow July 2015 - October 2020
Mentor: Dr. David Hopkinson, National Energy Technology Laboratory, Pittsburgh, Pennsylvania, USA
Topic: Layer-by-Layer Assemblies with Advanced Gas Separation Properties

Doctor of Philosophy August 2011 - May 2015
Advisor: Prof. Jaime C. Grunlan, Department of Mechanical Engineering, Texas A&M University, USA
Dissertation: Improvements in Processing and Stretchability of Super Gas Barrier Multilayer Thin Films

Master of Science September 2008 - June 2011
Advisor: Prof. Yong Wang, School of Materials Science and Engineering, Southwest Jiaotong University, China
Thesis: Modification of Immiscible HDPE/PA6 Blends using Carbon Nanotubes

Bachelor of Science September 2004 - June 2008
School of Materials Science and Engineering, Southwest Jiaotong University, China

Work Experience

Part-time Faculty January 2019 - Present
School of Engineering, Mathematics and Science, Robert Morris University, Moon Township, Pennsylvania, USA

Materials Engineering Researcher October 2020 - Present
Leidos Research Support Team, Pittsburgh, PA, 15236, USA

Immigration Status

- Permanent resident (green card holder)

Publications *32 papers (13 as a first author or corresponding author), 909 citations, as of 05/01/2021*

32. C. M. Koerner, D. P. Hopkinson, M. E. Ziomek-Moroz, A. Rodriguez, **F. M. Xiang (corresponding author)**. Environmentally Friendly Tannic Acid Multilayer Coating for Reducing Corrosion of Carbon Steel. ***I&EC Research***, 2021, 60, 243
31. P. F. Muldoon, S. R. Venna, D. W. Gidley, J. S. Baker, L. X. Zhu, Zi Tong, **F. M. Xiang**, D. P. Hopkinson, S. L. Yi, A. K. Sekizkardes, N. L. Rosi. Mixed Matrix Membranes from a Microporous Polymer Blend and Nanosized Metal-Organic Frameworks with Exceptional CO_2/N_2 Separation Performance. ***ACS Materials Lett.***, 2020, 2, 821
30. **F. M. Xiang,** E. J. Popczun, D. P. Hopkinson. Layer-by-layer assembly of metal-organic framework nanosheets with polymer. ***Nanotechnology***, 2019, 30, 345602.
29. **F. M. Xiang**, A. M. Marti, D. P. Hopkinson. Layer-by-Layer Assembled Polymer/Metal-Organic Framework (MOF) Composite Membrane with Individually Dispersed Filler Particles and Strong Filler-Matrix Interaction. ***Journal of Membrane Science***, 2018, 556, 146.
28. **F. M. Xiang**, D. Parviz, T. M. Givens, P. Tzeng, E. M. Davis, C. M. Stafford, M. J. Green, J. C. Grunlan. Stiff and Transparent Multilayer Thin Films Prepared Through Hydrogen-Bonding Layer-by-Layer Assembly of Graphene and Polymer. ***Advanced Functional Materials***, 2016, 26, 2143.
27. C. Y. Cho, **F. M. Xiang (co-first author)**, K. L. Wallace, J. C. Grunlan. Combined ionic and hydrogen bonding in polymer multilayer thin film for high gas barrier and stretchiness. ***Macromolecules***, 2015, 48, 5723.

26. **F. M. Xiang,** T. M. Givens, S. M. Ward, J. C. Grunlan. Elastomeric polymer multilayer thin film with sustainable gas barrier at high strain. ***ACS Applied Materials & Interfaces***, 2015, 7, 16148.
25. **F. M. Xiang**, T. M. Givens, J. C. Grunlan. Fast spray deposition of super gas barrier polyelectrolyte multilayer thin films. ***I&EC Research***, 2015, 54, 5254.
24. T. Guin, J. H. Cho, **F. M. Xiang**, C. J. Ellison, J. C. Grunlan. Water-Based Melanin Multilayer Thin Films with Broadband UV Absorption. ***ACS Macro Letters***, 2015, 4, 335.
23. **F. M. Xiang**, S. M. Ward, T. M. Givens, J. C. Grunlan. Structural tailoring of hydrogen-bonded poly(acrylic acid)/poly(ethylene oxide) multilayer thin films for reduced gas permeability. ***Soft Matter***, 2015, 11, 1001. Featured on Soft Matter Blog as a hot article for January 2015.
22. **F. M. Xiang**, S. M. Ward, T. M. Givens, J. C. Grunlan. Super stretchy polymer multilayer thin film with high gas barrier. ***ACS Macro Letters***, 2014, 3, 1055.
21. D. A. Hagen, C. Box, S. Greenlee, **F. M. Xiang**, O. Regev, J. C. Grunlan. High gas barrier imparted by similarly charged multilayers in nanobrick wall thin films. ***RSC Advances***, 2014, 4, 18354.
20. **F. M. Xiang,** P. Tzeng, J. S. Sawyer, O. Regev, J. C. Grunlan. Improving the gas barrier property of clay-polymer multilayer thin films using shorter deposition times. ***ACS Applied Materials & Interfaces***, 2014, 6, 6040.
19. H. Liu, J. Wang, X. M. Fan, F. Z. Zhang, H. R. Liu, J. Dai, **F. M. Xiang**. Synthesis of Cu_2O/T-ZnOW nanocompound and characterization of its photocatalytic activity and stability property under UV irradiation. ***Materials Science and Engineering: B***, 2013, 178, 158.
18. **F. M. Xiang**, Y. H. Wang, Y. Y. Shi, T. Huang, C. Chen, Y. Peng, Y. Wang. Morphology and mechanical property changes in compatibilized high density polyethylene/polyamide 6 nanocomposites induced by carbon nanotubes. ***Polymer International***, 2012, 61, 1334.
17. Y. Y. Shi, Y. L. Li, **F. M. Xiang**, T. Huang, C. Chen, Y. Peng, Y. Wang. Carbon nanotubes induced microstructure and mechanical properties changes in cocontinuous poly (L-lactide)/ethylene-co-vinyl acetate blends. ***Polymers for Advanced Technologies***. 2012, 23, 783.
16. H. Y. Wu, X. X. Li, **F. M. Xiang**, T. Huang, Y. Y. Shi, Y. Wang. Microstructure evolution of isotactic polypropylene during annealing: Effect of poly (ethylene oxide). ***Chinese Journal of Polymer Science***, 2012, 30, 199.
15. **F. M. Xiang**, Y. Y. Shi, X. X. Li, T. Huang, C. Chen, Y. Peng, Y. Wang. "Cocontinuous morphology of immiscible high density polyethylene/polyamide 6 blend induced by multiwalled carbon nanotubes network," ***European Polymer Journal***, 2012, 48, 350.
14. Y. L. Li, X. X. Li, **F. M. Xiang**, T. Huang, Y. Wang, J. Wu, Z. W. Zhou. Crystallization, rheological, and mechanical properties of PLLA/PEG blend with multiwalled carbon nanotubes. ***Polymers for Advanced Technologies***, 2011, 22, 1959.
13. **F. M. Xiang**, J. Wu, L. Liu, T. Huang, Y. Wang, C. Chen, Y. Peng, C. X. Jiang, Z. W. Zhou. Largely enhanced ductility of immiscible high density polyethylene/polyamide 6 blends via nano-bridge effect of functionalized multiwalled carbon nanotubes. ***Polymers for Advanced Technologies***, 2011, 22, 2533.
12. Y. L. Li, L. Liu, Y. Y. Shi, **F. M. Xiang**, T. Huang, Y. Wang, Z. W. Zhou. Morphology, rheological, crystallization behavior, and mechanical properties of poly (L-lactide)/ethylene-co-vinyl acetate blends with different VA contents. ***Journal of Applied Polymer Science***, 2011, 121, 2688.
11. L. Han, **F. M. Xiang**, Y. L. Li, T. Huang, Y. Wang, J. H. Zhang. Effect of mechanical pre-conditioning on fracture resistance of polypropylene. ***Chinese Journal of Polymer Science***, 2011, 29, 318.
10. J. Wu, **F. M. Xiang**, L. Han, T. Huang, Y. Wang, Y. Peng, H. Y. Wu. Effects of carbon nanotubes on glass transition and crystallization behaviors in immiscible polystyrene/polypropylene blends. ***Polymer Engineering & Science***, 2011, 51, 585.
9. X. X. Li, H. Y. Wu, T. Huang, Y. Y. Shi, Y. Wang, **F. M. Xiang**, Z. W. Zhou. β/α Transformation of β-polypropylene during tensile deformation: effect of crystalline morphology. ***Colloid and Polymer Science***, 2010, 288, 1539.

8. L. Liu, H. Y. Wu, Y. Wang, J. Wu, Y. Peng, **F. M. Xiang**, J. H. Zhang. Selective distribution, reinforcement, and toughening roles of MWCNTs in immiscible polypropylene/ethylene-co-vinyl acetate blends. ***Journal of Polymer Science Part B: Polymer Physics***, 2010, 48, 1882.
7. L. Han, Y. Wang, L. Liu, **F. M. Xiang**, T. Huang, Z. W. Zhou. Crystallization, mechanical and thermal properties of sorbitol derivatives nucleated polypropylene/calcium carbonate composites. ***Chinese Journal of Polymer Science***, 2010, 28, 457.
6. L. Han, X. X. Li, Y. L. Li, T. Huang, Y. Wang, J. Wu, **F. M. Xiang**. Influence of annealing on microstructure and physical properties of isotactic polypropylene/calcium carbonate composites with β-phase nucleating agent. ***Materials Science and Engineering: A***, 2010, 527, 3176.
5. Y. L. Li, H. Y. Wu, Y. Wang, L. Liu, L. Han, J. Wu, **F. M. Xiang**. Synergistic effects of PEG and MWCNTs on crystallization behavior of PLLA. ***Journal of Polymer Science Part B: Polymer Physics***, 2010, 48, 520.
4. L. Liu, Y. Wang, **F. M. Xiang**, Y. L. Li, L. Han, Z. W. Zhou. Effects of functionalized multiwalled carbon nanotubes on the morphologies and mechanical properties of PP/EVA blend. ***Journal of Polymer Science Part B: Polymer Physics***, 2009, 47, 1481.
3. L. Liu, Y. Wang, Y. L. Li, J. Wu, **F. M. Xiang**, Z. W. Zhou. Studies on fracture behaviors of immiscible polypropylene/ethylene-co-vinyl acetate blends with multiwalled carbon nanotubes. ***Journal of Polymer Science Part B: Polymer Physics***, 2009, 47, 1331.
2. Y. Wang, J. Shi, L. Han, **F. M. Xiang**. Crystallization and mechanical properties of T-ZnOw/HDPE composites. ***Materials Science and Engineering: A***, 2009, 501, 220.
1. Y. L. Li, Y. Wang, L. Liu, L. Han, **F. M. Xiang**, Z. W. Zhou. Crystallization improvement of poly (L-lactide) induced by functionalized multiwalled carbon nanotubes. ***Journal of Polymer Science Part B: Polymer Physics***, 2009, 47, 326.

Teaching and Mentoring

Part-time Faculty at Robert Morris University January 2019 - Present

- Teaching *Polymeric and Ceramic Materials*

Teaching Assistant for Materials Science Courses September 2011- May 2012

- Grading homework, exams, and papers, in addition to holding office hours.

Mentor to Undergraduate Researchers,

- Postdoctoral mentor to Christy M. Koerner at National Energy Technology Laboratory. January 2019 – now
- Graduate mentor to T. Givens in the Mechanical Engineering Department at Texas A&M University. January 2014 - April 2015
- Graduate mentor to S. Ward in the Chemistry Department at Texas A&M University. October 2013 - May 2014
- Graduate mentor to J. Sawyer in the Mechanical Engineering Department at Texas A&M University. October 2012 - May 2013
- Graduate mentor to J. Chen in the School of Materials Science and Engineering at Southwest Jiaotong University. January 2011 - June 2011
- Graduate mentor to K. Ren in the School of Materials Science and Engineering at Southwest Jiaotong University. January 2010 - June 2010
- Graduate mentor to Y. M. Huang in the School of Materials Science and Engineering at Southwest Jiaotong University. January 2009 - June 2009

Professional Development

ACS Postdoc to Faculty Workshop August 19, 2016 - August 20, 2016

- Understood the differences between Research Institutions and Primarily Undergraduate Institutions in terms of teaching, research, and service
- Interacted with program officers of several grant funding agencies including Research Corporation, ACS PRF, NSF, and NIH/NCI
- Found out information regarding interactive pedagogy

STEM Teaching Professional Development September 2013 - December 2013

- Learned different teaching methods and developed my own teaching philosophy
- Gave one lecture in an undergraduate level Introduction to Materials Science and Engineering class

Services

- Served as a peer reviewer for Journals: Advanced Materials, Applied Surface Science, Chemical Engineering Journal, Green Materials, Industrial & Engineering Chemistry Research, Journal of Applied Polymer Science, Journal of Materials Science, Journal of Membrane Science, Journal of Polymer Science - Part B, Polymer, Polymer Bulletin, Separation and Purification Technology
- Served as a grant reviewer for U.S. Department of Energy SBIR/STTR proposals

Technical Skills

Experimental: AFM, SEM, DSC, TGA, QCM, UV-Vis, FTIR, DMA, rheometer, ellipsometer, twin screw extrusion, injection molding, tensile test, impact fracture test, optical microscopy

Computer: LabVIEW, Origin, Adobe Photoshop, Microsoft Office

Language: Fluent in English and Chinese

Society Membership

American Chemical Society [ACS] (2014 - present)

Conference Presentations

10. **Fangming Xiang**, David Hopkinson, Environmentally Friendly Multilayer Coating for Carbon Steel Corrosion Prevention. **MS&T** 2019, Portland, OR.
9. **F.M. Xiang**, Polymer/MOF Composite Membrane with Individually Dispersed Filler Particles and Strong Filler-Matrix Interaction. ***North American Membrane Society (NAMS) Annual Meeting*** *2018*, Lexington, KY.
8. **F.M. Xiang**, Layer-By-Layer Assembly for Water Desalination and Gas Separation. ***AIChE Annual Meeting*** *2016*, San Francisco, CA.
7. **F.M. Xiang**, Unprecedented Improvement in Mechanical Property Achieved through Layer-By-Layer Assembly of Polymer and Oxidation-Free Graphene. ***AIChE Annual Meeting*** *2016*, San Francisco, CA.
6. **F.M. Xiang**, Layer-by-layer assembled multilayer membranes with advanced transport properties. ***252nd American Chemical Society National Meeting & Exposition*** *2016*, Philadelphia, PA.
5. **F.M. Xiang**, J.C. Grunlan, New method for preparing polymer/pristine graphene multilayer thin films with unprecedented modulus improvement and high transparency. ***252nd American Chemical Society National Meeting & Exposition*** *2016*, Philadelphia, PA.

4. **F.M. Xiang**, S.M. Ward, T.M. Givens, J.C. Grunlan, Super stretchy polymer multilayer thin films with tunable gas barrier. **APS March Meeting** *2015*, San Antonio, TX.
3. **F.M. Xiang**, M. Priolo, G. Laufer, B. Stevens, K. Holder, J.C. Grunlan, Composite Nanocoatings for Food Packaging: Transparent, Stretchable Thin Films with Super Gas Barrier. **Journey through Science Day with PepsiCo** *2014*, New York, NY.
2. **F.M. Xiang**, P. Tzeng, J.S. Sawyer, O. Regev, J.C. Grunlan, Improving gas barrier of clay-polymer multilayer thin films using shorter deposition times. ***248th American Chemical Society National Meeting & Exposition*** *2014*, San Francisco, CA.
1. **F.M. Xiang**, S.M. Ward, J.C. Grunlan, Super Stretchy Multilayer Thin Film Gas Barrier. ***248th American Chemical Society National Meeting & Exposition*** *2014*, San Francisco, CA.

For more information, please visit my personal website https://fangmingxiang.weebly.com