Curriculum Vitae: Wei Zhang, Ph.D.

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University of Colorado Boulder
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EDUCATION

University of Illinois at Urbana-Champaign, Department of Chemistry (2001-2005)
Ph.D. in Chemistry (Thesis Advisor: Professor Jeffrey S. Moore)

Peking University, Department of Polymer Science & Engineering, College of Chemistry and Molecular Engineering (1996-2000), B.S. in Chemistry

RESEARCH INTERESTS

Design and synthesis of novel organic functional materials and nanocomposites, including shape-persistent macrocycles, molecular cages, porous materials, and malleable self-healing polymers; Investigation of their structure-property relationship; Exploration of their potential applications in carbon capture, molecular separation, artificial photosynthesis, energy storage, etc.

EMPLOYMENT

University of Colorado at Boulder (07/2014 - Present)
Associate Professor of Chemistry and Biochemistry

University of Colorado at Boulder (08/2008 – 06/2014)
Assistant Professor of Chemistry and Biochemistry

Massachusetts Institute of Technology (03/2006 - 07/2008)
Post-doctoral Associate (Mentor: Professor Timothy M. Swager)

AWARDS AND HONORS

2016 Guest Professor at Yunnan University, China
2015 Guest Professor at ETH Zürich, Switzerland
2014 Tang Ao-Qing Guest Professor at Jilin University, China
2013 Provost's Faculty Achievement Award
2013 Alfred P. Sloan Research Fellow
2013 CAPA Distinguished Junior Faculty Award
2012 3M Non-Tenured Faculty Award
2011 National Science Foundation (NSF) CAREER Award
2011 Thieme Chemistry Journal Award
2011 New Inventor of the Year, University of Colorado
2009 CRCW Junior Faculty Development Award, University of Colorado
2004 Synthetic Organic Fellowship in Chemistry, University of Illinois
2004 R. C. Fuson Travel Award, University of Illinois
2003 R. C. Fuson Fellowship, University of Illinois
2002 University Fellowship, University of Illinois
2000 Outstanding Graduate in City of Beijing

2000 Outstanding Graduate of Peking University

PUBLICATIONS (PEER-REVIEWED)

Independent Career at CU-Boulder

73. McCaffrey, R.; Gong, Y.; Jin, Y.; Long, H.; Park, W.; **Zhang, W**.* "Cage-Templated Synthesis of Highly Stable Palladium Nanoparticles and Their Catalytic Activities in Suzuki-Miyaura Coupling", *submitted*.

72. Singh, Z. V.; Tan, L.-L.; Cowan, M. G.; Yang, Y.-W.*; **Zhang, W.***; Gin, D. L.*; Noble, R. D.* "Pillar[5]arene/matrimid Materials for High-performance Methane Purification Membranes", *submitted*.

71. Du, Y.; Yang, H.; Wan, S.; Jin, Y.; **Zhang, W**.* "A Titanium-based Porous Coordination Polymer Containing Arylene-Ethynylene Macrocycles as Recyclable Catalyst for Fixation of CO_2", *under revision*.

70. Ortiz, M.; Cho, S.; Niklas, J.; Kim, S.; Poluektov, O. G.; **Zhang, W.***; Rumbles, G.*; Park, J.* "Through-space ultrafast photoinduced electron transfer dynamics of a C_{70}-encapsulated bisporphyrin covalent organic polyhedron in a low-dielectric medium" *J. Am. Chem. Soc*. **2017**, *accepted*.

69. Okochi, K. D.; Monfregola, L.; Dickerson, S. M.; McCaffrey, R.; Domaille, D. W.; Yu, C.; Hafenstine, G.; Jin, Y.; Cha, J.; Kuchta, R. D.; Caruthers, M.; **Zhang, W.*** "Synthesis of Small Molecule/DNA Hybrids through On-Bead Amide Coupling Approach", *J. Org. Chem*. **2017**, *accepted*.

68. Yang, H.; Zhu, Y.; Du, Y.; Tan, D. ; Jin, Y. ; **Zhang, W**.* "Aromatic-Rich Hydrocarbon Porous Networks through Alkyne Metathesis", *Mater. Chem. Front.* **2017**, DOI: 10.1039/C6QM00359A.

67. Yu, C.; Jin, Y.; **Zhang, W**.* "Two-dimensional Polymer Synthesis by Dynamic Chemistry at the Air–water Interface", *Encyclopedia of Interfacial Chemistry* (invited), *accepted*.

66. Tayton, P.; Zhu, C.; Loob, S.; Shoemaker, R.; Pritchard, J.; Jin, Y.; **Zhang, W.*** "Re-healable Polyimine Thermosets: Polymer Composition and Moisture Sensitivity" *Polym. Chem.* **2016**, *7*, 7052-7056.

65. Yu, C.; Long, H.; Jin, Y.; **Zhang, W.*** "Synthesis of Cyclic Porphyrin Trimers through Alkyne Metathesis Cyclooligomerization and Their Host–Guest Binding Study", *Org. Lett*. **2016**, *18*, 2946-2949.

64. Wang, Q.; Yu, C.; Long, H.; Du, Y.; Zhang, C.; Azarnoush, S.; Jin, Y.; **Zhang, W.*** "Dynamic Covalent Synthesis of Aryleneethynylene Cage through Alkyne Metathesis: Dimer, Tetramer, or Interlocked Complex?", *Chem. Sci.* **2016**, *7*, 3370-3376.

63. Du, Y.; Yang, H.; Zhu, C.; Shoemaker, R.; Jin, Y.; **Zhang, W.*** "Highly Active Multidentate Triphenolmethine-Based Alkyne Metathesis Catalysts", *Chem. Eur. J*. **2016**, *22*, 7959-7963.

62. Lu, G.; Zhu, Y.; Lu, L.; Xu, K.; Wang, H.; Jin, Y.; Ren, Z.; Liu, Z.; **Zhang, W.*** "Iron-rich Nanoparticle Encapsulated, Nitrogen Doped Porous Carbon Materials as Efficient Cathode Electrocatalyst for Microbial Fuel Cells", *J. Power Sources*, **2016**, *315*, 302-307.

61. Hu, X.; Yu, C.; Okochi, K.; Jin, Y.; Liu, Z.; **Zhang, W.*** "Phenylene–Vinylene Macrocycles as Artificial Transmembrane Transporters" *Chem. Commun.* **2016**, *52*, 5848-5851.

60. Taynton, P.; Ni, H.; Zhu, C.; Yu, K.; Loob, S.; Jin, Y.; Qi, H. J.; **Zhang, W.*** "Repairable Woven Carbon Fiber Composites with Full Recyclability Enabled by Malleable Thermosets", *Adv. Mater*. **2016**, *28*, 2904-2909. Highlighted by multiple media, including CompositesWorld, CPRJ

International, Environmental Leader, Colorado Business Roundtable (COBRT), CU Connect, CU Arts & Science College.

59. Du, Y.; Yang, H.; Whiteley, J. M.; Wan, S.; Jin, Y.; Lee, S.-H.; **Zhang, W.*** "Ionic Covalent Organic Frameworks with Spiroborate Linkage" *Angew. Chem., Int. Ed*. **2016**, *55*, 1737-1741.

58. Dai, W.; Shao, F.; Szczerbiński, J.; McCaffrey, R.; Zenobi, R.; Jin, Y.; Schlüter, A. D.; **Zhang, W.*** "Synthesis of a Two-Dimensional Covalent Organic Monolayer through Dynamic Imine Chemistry at the Air/Water Interface" *Angew. Chem. Int. Ed*. **2016**, *55*, 213-217. "Very Important Paper" (**VIP**).

57. Zhu, Y.; Wan, S.; Jin, Y.; **Zhang, W.*** "Desymmetrized Vertex Design for the Synthesis of Covalent Organic Frameworks with Periodically Heterogeneous Pore Structures" *J. Am. Chem. Soc*. **2015**, *137*, 13772-13775.

56. Lu, G.; Zhu, Y.; Xu, K.; Jin, Y.; Ren, Z. J.; Liu, Z.; **Zhang, W.*** "Metallated Porphyrin Based Porous Organic Polymers as Efficient Electrocatalysts" *Nanoscale*, **2015**, *7*, 18271-18277.

55. Zhang, C.; Yu, C.; Long, H.; Denman, R. J.; Jin, Y.; **Zhang, W.*** "Synthesis of Phenylene Vinylene Macrocycles through Acyclic Diene Metathesis Macrocyclization and Their Unexpected Aggregation Behavior" *Chem. Eur. J*. **2015**, *21*, 16935-16940.

54. Whiteley, J. M.; Taynton, P.; **Zhang, W.***; Lee, S-H.* "Ultrathin Solid-State Li-ion Electrolyte Membrane Facilitated by a Self-Healing Polymer Matrix" *Adv. Mater*. **2015**, *27*, 6922-6927.

53. Wang, Q.; Yu, C.; long, H.; Du, Y.; Jin, Y.; **Zhang, W.*** "Solution Phase Dynamic Assembly of Permanently Interlocked Aryleneethynylene Cages Through Alkyne Metathesis" *Angew. Chem., Int. Ed.* **2015**, *54*, 7550–7554.

52. Yang, H.; Du, Y.; Wan, S.; Trahan, G. D.; Jin, Y.; **Zhang, W.*** "Mesoporous 2D Covalent Organic Frameworks Based on Shape-Persistent Arylene-Ethynylene Macrocycles" *Chem. Sci.* **2015**, *6*, 4049-4053.

51. Lu, G.; Yang, H.; Zhu, Y.; Huggins, T.; Ren, Z. J.; Liu, Z.; **Zhang, W.*** "Synthesis of Conjugated Porous Co(II) Porphyrinylene-Ethynylene Framework Through Alkyne Metathesis and Its Catalytic Activity Study" *J. Mater. Chem. A*. **2015**, *3*, 4954-4959.

50. Yu, C.; Jin, Y.; **Zhang, W.*** "Shape-Persistent Arylene-Ethynylene Organic Hosts for Fullerenes" (invited personal account) *The Chemical Record* **2015**, *15*, 97-106.

49. Yu, K.; Taynton, P.; **Zhang, W.**; Dunn, M. L.; Qi, H. J. "Influence of Stoichiometry on the Glass Transition and Bond Exchange Reactions in Epoxy Thermoset Polymers" *RSC Advance* **2014**, *4*, 48682-48690.

48. Zhu, Y.; **Zhang, W***. "Reversible Tuning of Pore Size and CO2 Adsorption in Azobenzene Functionalized Porous Organic Polymers" *Chem. Sci.* **2014**, *5*, 4957-4961.

47. Wang, Q.; Zhang, C.; Noll, B. C.; Long, H.; Jin, Y, **Zhang, W***. "Tetrameric Cage with a D_{2h} Symmetry through Alkyne Metathesis" *Angew. Chem. Int. Ed*. **2014**, *53*, 10663-10667.

46. Sun, H.; She, P.; Lu, G.; Xu, K.; **Zhang, W.**; Liu, Z. "Recent Advances in the Development of Functionalized Carbon Nanotubes: a Versatile Vector for Drug Delivery" *J. Mater. Sci.* **2014**, *49*, 6845-6854.

45. Jin, Y.; Wang, Q.; Taynton, P.; **Zhang, W.*** "Dynamic Covalent Chemistry Approach Towards 2-D Macrocycles, 3-D Molecular Cages, and polymers" (invited review), *Acc. Chem. Res.*, **2014**, *47*, 1575-1586.

44. Yu, C.; Cowan, M. G.; Noble, R. D.; **Zhang, W.*** "A Silver(I) Coordinated Phenanthroline-Based Polymer with High Ethylene/Ethane Adsorption Selectivity" *Chem. Commun.* **2014**, *50*, 5745-5747.

43. Taynton, P.; Yu, K.; Shoemaker, R.; Jin, Y.; Qi, H.; **Zhang, W.*** "Heat or Water Driven Self-Healing in a Highly-Recyclable Covalent Network Polymer", *Adv. Mater*. **2014**, *26*, 3938-3942.

42. Yu, K.; Taynton, P.; **Zhang, W.***; Dunn, M. L.; Qi, H.* "Reprocessing and Recycling of Thermoset Polymers based on Bond Exchange Reaction", *RSC Advance* **2014**, *4*, 10108-10117.

41. Yang, H.; Jin, Y.; Du, Y.; **Zhang, W.*** "Application of Alkyne Metathesis in Polymer Synthesis" (invited contribution for *2014 Emerging Investigators* issue), *J. Mater. Chem. A*. **2014**, *2*, 5986-5993.

40. McCaffrey, R.; Long, H.; Park, W.; **Zhang, W**.* "Template Synthesis of Gold Nanoparticles with an Organic Molecular Cage", *J. Am. Chem. Soc*. **2014**, *136*, 1782-1785.

39. Zhu, Y.; Yang, H.; Jin, Y.; **Zhang, W.*** "Porous Poly(aryleneethynylene) Frameworks through Alkyne Metathesis", *Chem. Mater*. **2013**, *25*, 3718-3723.

38. Okochi, K. D.; Han, G. S.; Aldridge, I. M.; Liu, Y.; **Zhang, W**.* "Covalent Assembly of Hetero-Sequenced Macrocycles and Molecular Cages Through Orthogonal Dynamic Covalent Chemistry (ODCC)", *Org. Lett*. **2013**, 15, 4296-4299.

37. Hu, K.; Yang, H.; **Zhang, W.***; Qin, Y.* "Solution Processable Polydiacetylenes (PDAs) through Acyclic Enediyne Metathesis Polymerization", *Chem. Sci*. **2013**, *4*, 3649-3653.

36. Jin, Y.; Yu, C.; Denman, R. J.; **Zhang, W.*** "Recent Advances in Dynamic Covalent Chemistry" (invited review), *Chem. Soc. Rev.* **2013**, *42*, 6634-6654.

35. Zhu, Y.; Long, H.; **Zhang, W.*** "Imine-Linked Porous Polymer Frameworks with High Small Gas (H_2, CO_2, CH_4, C_2H_2) Uptake and CO_2/N_2 Selectivity" *Chem. Mater*. **2013**, *25*, 1630-1635.

34. Yang, H.; Liu, Z.; **Zhang, W.*** "Novel Multidentate Triphenolsilane-Based Alkyne Metathesis Catalysts: Excellent Functional Group Tolerance and Lifetime" *Adv. Synth. Catal.* **2013**, *355*, 885-890.

33. Park, W.*; Emoto, K.; Jin, Y.; Shimizu, A.; Tamma, V.; **Zhang, W.*** "Controlled Self-Assembly of Gold Nanoparticles Mediated by Novel Organic Molecular Cages" *Opt. Mater. Express* **2013**, *3*, 205-215. Top downloaded article of the month.

32. Jin, Y. Zhu, Y.; **Zhang, W.*** "Development of Organic Porous Materials through Schiff-Base Chemistry" (invited review for the special issue on *Organic Porous Materials*, cover article), *CrystEngComm*, **2013**, *15*, 1484-1499. Top ten accessed article of the month.

31. Jin, Y.; Jin. A.; McCaffrey, R.; Long, H.; **Zhang, W.*** "Design Strategies for Shape-Persistent Covalent Organic Polyhedrons (COPs) through Imine Condensation/Metathesis" *J. Org. Chem*. **2012**, *77*, 7392-7400.

30. Lohrman, J.; Zhang, C.; **Zhang, W.***; Ren, S.* "Self-Assembled Semiconducting Single-Wall Carbon Nanotube and Covalent Organic Polyhedron (COP)-C_{60} Nanohybrids for Light Harvesting", *Chem. Commun.* **2012**, *48*, 8377-8379.

29. Okochi, K.; Jin, Y.; **Zhang, W.*** "Highly Efficient One-pot Synthesis of Hetero-sequenced Shape-persistent Macrocycles through Orthogonal Dynamic Covalent Chemistry (ODCC)" (invited contribution to special *2013 Emerging Investigators* issue), *Chem. Commun.* **2013**, *49*, 4418-4420.

28. Jyothish, K.; Wang, Q.; **Zhang, W.*** "Highly Active Multidentate Alkyne Metathesis Catalysts: Ligand-activity Relationship and Their Applications in Efficient Synthesis of Porphyrin-based Aryleneethynylene Polymers" *Adv. Synth. Catal.* **2012**, *354*, 2073-2078.

27. Zhang, C.-X.; Long, H.; **Zhang, W.*** "A C_{84} Selective Porphyrin Macrocycle with an Adaptable Cavity Constructed through Alkyne Metathesis" *Chem. Commun.* **2012**, *48*, 6172-6174 (invited contribution to special *Aromaticity* issue).

26. Jin, Y.; Voss, B. A.; McCaffrey, R.; Baggett, C. T.; Noble, R. D.; **Zhang, W.*** "Microwave-Assisted Syntheses of Highly CO_2-Selective Organic Cage Frameworks (OCFs)" *Chem. Sci*. **2012**, *3*, 874-877.

25. Zhang, C.-X.; Wang, Q.; Long, H.; **Zhang, W.*** "A Highly C_{70}-Selective Shape-Persistent Rectangular Prism Constructed Through One-Step Alkyne Metathesis" *J. Am. Chem. Soc*. **2011**, *133*, 20995-21001.

24. Jyothish, K.; **Zhang, W.*** "Towards Highly Active and Robust Alkyne Metathesis Catalysts: Recent Developments in Catalyst Design" *Angew. Chem. Int. Ed*. **2011**, *50*, 8478-8480.

23. Jin, Y.; Voss, B. A.; Jin, A.; Long, H.; Noble, R. D.; **Zhang, W.*** "Highly CO_2-Selective Organic Molecular Cages: What Determines the CO_2 Selectivity" *J. Am. Chem. Soc.* **2011**, *133*, 6650-6658.

22. Jyothish, K.; **Zhang, W.*** " Introducing Podand Motif to Alkyne Metathesis Catalyst Design: A Highly Active Multidentate Mo(VI) Catalyst Resisting Alkyne Polymerization" *Angew. Chem. Int. Ed.* **2011**, *50*, 3435-3438.

21. Jin. Y.; Zhang, A.; Huang, Y.; **Zhang, W.*** "Shape-Persistent Arylenevinylene Macrocycles (AVMs) Prepared via Acyclic Diene Metathesis Macrocyclization (ADMAC)", *Chem. Commun.* **2010**, *46*, 8258-8260.

20. Jin, Y.; Voss, B.; Noble, R. D.; **Zhang, W.*** "A Shape-Persistent Organic Molecular Cage with High Selectivity in Adsorption of CO_2 over N_2" *Angew. Chem. Int. Ed*. **2010**, *49*, 6348-6351 (highlighted by *Nature Chemistry*. http://www.nature.com/nchem/reshigh/2010/0810/full/nchem.833.html, and *Synfacts* **2010**, *11*, 1247).

Postdoc Career at MIT

19. **Zhang, W.**; Shaikh, A. U.; Tsui, E. Y.; Swager, T. M. "Cobalt Porphyrin Functionalized Carbon Nanotubes for Oxygen Reduction" *Chem. Mater*. **2009**, *21*, 3234-3241.

18. **Zhang, W.**; Sprafke, J. K.; Ma, M.; Tsui, E. Y.; Sydlik, S. A.; Rutledge, G. C.; Swager, T. M. "Modular Functionalization of Carbon Nanotubes and Fullerenes" *J. Am. Chem. Soc*. **2009**, *131*, 8446-8454.

17. **Zhang, W.**; Swager, T. M. "Functionalization of Single-Walled Carbon Nanotubes and Fullerenes via a Dimethyl Acetylenedicarboxylate-4-Dimethylaminopyridine Zwitterion Approach" *J. Am. Chem. Soc.* **2007**, *129*, 7714-7715.

Graduate Career at UIUC

16. Suzuki, T.; Lu, Y.; **Zhang, W.**; Moore, J. S.; Mariñas, B.J. "Performance Characterization of Nanofiltration Membranes on Rejection Using Rigid Star Amphiphiles" *Environ. Sci. & Technol.* **2007**, 41, 6246-6252.

15. **Zhang, W.**; Moore, J. S. "Alkyne Metathesis: Catalysts and Synthetic Application" (review) *Adv. Synth. & Catal.* **2007**, *349*, 93-120.

14. Lu, Y.; Suzuki, T.; **Zhang, W.**; Mi, B.; Mariñas, B. J.; Moore, J. S. "Nanofiltration Membranes based on Rigid Star Amphiphiles" *Chem. Mater.* **2007**, *12*, 3194-3204.

13. Naddo, T.; Che, Y.; **Zhang, W.**; Balakrishnan, K.; Yang, X.; Yen, M.; Zhao, J.; Moore, J. S.; Zang, L. "Detection of Explosives with a Fluorescent Nanofibril Film" *J. Am. Chem. Soc.* **2007**, *129*, 6978-6979.

12. **Zhang, W.**; Lu, Y.; Moore, J. S. "Preparation of a Trisamidomolybdenum(VI) Propylidyne Complex-A Highly Active Catalyst Precursor for Alkyne Metathesis" *Org. Synth.* **2007**, *84*, 163-176.

11. **Zhang, W.**; Cho, H.-M.; Moore, J. S "Preparation of Carbazole-Based Tetracycle via Precipitation-Driven Alkyne Metathesis" *Org. Synth.* **2007**, *84*, 177-191.

10. **Zhang, W.**; Moore, J. S. "Shape-Persistent Macrocycles: Structures and Synthetic Approaches from Arylene and Ethynylene Building Blocks" (review) *Angew. Chem. Int. Ed.* **2006**, *45*, 4416-4439; *Angew. Chem.* **2006**, *118*, 4524-4548.
9. Balakrishnan, K.; Datar, A.; **Zhang, W.**; Yang, X.; Naddo, T.; Huang, J.; Zuo, J.; Yen, M.; Moore, J. S.; Zang, L. "Nanofibril Self-Assembly of an Arylene Ethynylene Macrocycle" *J. Am. Chem. Soc.* **2006**, *128*, 6576-6577.
8. **Zhang, W.**; Moore, J. S. "Reaction Pathways Leading to Arylene Ethynylene Macrocycles via Alkyne Metathesis" *J. Am. Chem. Soc.* **2005**, *127*, 11863-11870.
7. **Zhang, W.**; Brombosz, S. M.; Mendoza, J. L.; Moore, J. S. "A High-Yield, One-Step Synthesis of *o*-Phenylene Ethynylene Cyclic Trimer via Precipitation-Driven Alkyne Metathesis" *J. Org. Chem.* **2005**, *70*, 10198-10201.
6. **Zhang, W.**; Moore, J. S. "Arylene Ethynylene Macrocycles Prepared by Precipitation-Driven Alkyne Metathesis" *J. Am. Chem. Soc*. **2004**, *126*, 12796-12796.
5. **Zhang, W.**; Moore, J. S. "Synthesis of Poly(2,5-thienyleneethynylene)s by Alkyne Metathesis" *Macromolecules* **2004**, *37*, 3973-3975.
4. **Zhang, W.**; Kraft, S.; Moore, J. S. "Highly Active Trialkoxymolybdenum(VI) Alkylidyne Catalysts Synthesized by a Reductive Recycle Strategy" *J. Am. Chem. Soc.* **2004**, *126*, 329-335.
3. **Zhang, W.**; Kraft, S.; Moore, J. S. "A Reductive Recycle Strategy for the Facile Synthesis of Molybdenum(VI) Alkylidyne Catalysts for Alkyne Metathesis" *Chem. Commun*. **2003**, 832-833.
2. You, L.-C.; Lu, F.-Z.; Li, Z.-C.; **Zhang, W.**; Li, F.-M. "Glucose-Sensitive Aggregates Formed by Poly(ethylene oxide)-*block*-poly(2-glucosyloxyethyl acrylate) with Concanavalin A in Dilute Aqueous Medium" *Macromolecules* **2003**, *36*, 1-4.
1. Fleming, M.; Fisher, P. V.; Gunawardena, G. U.; Jin, Y.; Zhang, C.; **Zhang, W.**; Arif, A. M.; West, F. G. "Solvent Trapping of Photochemically Generated Pyran-4-one-Derived Oxyallyls: A Convenient Cyclopentannulation Method" *Synthesis* **2001**, 1268-1274.

PATENTS

Independent Career at CU-Boulder

10. **Zhang, W.**; Wang, Q. "A C_{70}-Selective Tetrameric Cage with an Unexpected C2 Symmetry through One-Step Alkyne Metathesis" US Patent Application (08/21/2015).
9. **Zhang, W.**; Taynton, P. "Novel Covalently Cross-Linked Malleable Polymers and Methods of Use" PCT Patent Application (09/17/2015).
8. **Zhang, W.**; McCaffrey, R.; Park, W.; Emoto, K.; Jin, Y. "Methods of Preparing Novel Self-Assembling Nanocomposite Structures" *U.S. Pat. Appl. Publ*. **2014**, US 20140212575.
7. **Zhang, W.**; Ren, S.; Zhang, C. "Nanohybrid Compositions Comprising Carbon Nanotubes and Covalent Organic Polyhedron-Fullerene Complexes" US Patent Application (04/21/12).
6. **Zhang, W.**; Jyothish, K.; Wang, Q. "Highly Active Multidentate Catalysts for Efficient Alkyne Metathesis to Prepare Disubstituted Alkynes" *U.S. Pat. Appl. Publ*. **2013**, US 2013261295.
5. **Zhang, W.**; Zhang, C.; Wang, Q. "Preparation of Porphyrin Cages for Fullerene Separation" *PCT Int. Appl*. **2013**, WO 20133063368.
4. **Zhang, W.**; Noble, R. D.; Jin, Y.; Voss, B. A. "Organic Porous Materials Comprising Shape-Persistent Three-Dimensional Molecular Cage Building Blocks" *PCT Int. Appl*. **2011**, WO 2011116359.

3. Yu, M.; **Zhang, W.**; Falconer, J. L.; Noble, R. D. "Anode with Layered Structures for High-Efficiency Dye-Sensitized Solar Cells and Its Fabrication" *U.S. Pat. Appl. Publ*. **2011**, US 20110284063.

Postdoc Career at MIT

2. Swager, T. M.; **Zhang, W.** " Functionalization of Nanoscale Articles including Nanotubes and Fullerenes" *U.S. Pat. Appl. Publ*. **2008**, 19pp.

Graduate Career at UIUC

1. Zang, L.; Moore, J. S.; Naddo, T.; **Zhang, W.** "Fluorescent Organic Nanofibrils as Sensory Materials for Explosives Detection" *U.S. Pat. Appl. Publ.* **2009**, 48pp.

INVITED PRESENTATIONS (INDEPENDENT CAREER)

(a) Invited Lectures at Professional Meetings

84. "Tessellation in Two Dimensional Covalent Organic Frameworks", The 1st International Symposium on Porous Organic Polymers, Zhangjiajie, China, September 2017. (Keynote)
83. "Shape-persistent Macrocycles and Nanocages through Dynamic Covalent chemistry", The 7th International Conference on Nanoscale and Technology, Beijing, China, August 2017.
82. "Development and Applications of Multidentate Mo(VI) Carbyne Catalysts for Alkyne Metathesis", The 22nd International Symposium on Olefin Metathesis and Related Chemistry (ISOM XXII), Zürich, Switzerland, July 2017.
81. "Templated Synthesis of Nanoparticles Using Nanocages and Covalent Organic Frameworks", The 12th Sino-US Nano Symposium, Beijing, China, May 2017.
80. "Bottom-up Design, Synthesis and Study of Hierarchical Nanostructured Porous Materials", Sino-Deutsch Symposium GZ1322 on Porous Organic Polymers for Sustainable Applications, Beijing, China, September 2016.
79. "Novel Malleable Covalent Networks and Their Applications in Repairable Carbon Fiber Reinforced Composites with Full Recyclability", 3rd International Conference on Aircraft Interior Composites & Lightweight Materials, Seattle, WA, USA, August 2016.
78. "Repairable Carbon Fiber Reinforced Composites with Full Recyclability Enabled by Novel Malleable Covalent Networks", 5th Global Automotive Lightweight Materials Conference, Detroit, MI, USA, August 2016.
77. "From Covalent Organic Frameworks to 2D Covalent Monolayer: a Journey with Dynamic Covalent Chemistry", 2nd International Symposium on Synthetic Two-Dimensional Polymers (S2DP-2), Nara, Japan, June 2016.
76. "Bottom-up Design, Synthesis and Study of Hierarchical Nanostructured Porous Materials", 2015 Pacifichem, Honolulu, HI, USA, December 2015.
75. "Modular Design of Porous Organic Polymers from Preporous Building Blocks", Symposium on Porous Materials for Energy and Sustainability from Discovery to Application, 250th American Chemical Society (ACS) Meeting, Boston, MA, USA, August 2015.
74. "Design and Synthesis of Organic Molecular Cages with High Fullerene Binding Selectivity", 16th International Symposium on Novel Aromatic Compounds (ISNA-16), Madrid, Spain, July 2015.
73. "Porous Organic Polymers for Electrocatalysis and Photoresponsive Gas Adsorption", Symposium on Nanostructured Porous Polymers: Synthesis, Properties, and Applications, 249th American Chemical Society (ACS) Meeting, Denver, CO, USA, Mar 2015.

72. "Shape-Persistent Covalent Organic Macrocycles and Polyhedrons Through Dynamic Covalent Chemistry", 9th International Symposium on Macrocyclic and Supramolecular Chemistry (ISMSC-9), Shanghai, China, June 2014.
71. "Development of Novel Organic Molecular Cages and Their Biological Activity Study", 10th Sina-US CAPA Conference, Jinan, China, June 2014.
70. "3-D Covalent Organic Polyhedrons (COPs) and Porous Polymer Frameworks (PPFs) through Dynamic Covalent Chemistry", Polymer Science Research and Teaching: A Tribute to Professor Jeffrey S. Moore, 246th American Chemical Society (ACS) Meeting, Indianapolis, IN, USA, Sept 2013.
69. "Alkyne Metathesis: Catalyst Design and Synthetic Applications" 20th International Symposium on Olefin Metathesis and Related Chemistry (ISOM-20), Nara, Japan, July 2013.
68. "Development and Applications of Dynamic Covalent Chemistry: From 2-D and 3-D Molecular Architectures to Functional Materials", 9th Sino-US Chemistry Professors Conference, Chengdu, China, July 2013.
67. "Development 2-D and 3-D Functional Molecular Architectures Through Dynamic Covalent Chemistry", ACS Award for Creative Invention: Symposium in Honor of Timothy M. Swager, 245th American Chemical Society (ACS) National Meeting, New Orleans, LA, USA, Apr 2013.
66. "Development and Applications of Dynamic Covalent Chemistry: From 2-D and 3-D Molecular Architectures to Functional Materials", Organic Young Academic Investigator Symposium, 244th American Chemical Society (ACS) National Meeting, Philadelphia, PA, USA, August 2012.
65. "Novel Porous Framework Materials Consisting of 3-D Shape-Persistent Organic Molecular Cages", PMSE Young Investigator Symposium, ACS Meeting, Philadelphia, PA, USA, August 2012.
64. "Design and Applications of Novel Porous Materials based on Covalent Organic Polyhedrons (COPs)", special symposium on "Design and Applications of Organic and Metal-Organic Porous Materials", 244th American Chemical Society Meeting, Philadelphia, PA, USA, August 2012.
63. "Highly CO_2-Selective Organic Molecular Cages for Carbon Capture", special symposium on "Greenhouse Gas Emissions: Control, Conversion and Utilization for Fuels and Energy Production", 242nd American Chemical Society (ACS) National Meeting, Denver, CO, USA, August 2011.
62. "Shape-Persistent Organic Molecular Cages for Carbon Capture", Pacifichem2010, Honolulu, HI, USA, December 2010.

(b) Invited Lectures at Universities/Institutes

61. SKLECE, Chinese Academy of Sciences, Beijing, China, Mar 2017.
60. Tianjin University, Tianjin, China, Mar 2017.
59. University of Houston, Houston, TX, Feb 2017.
58. Colorado School of Mines, Golden, CO, Nov 2016.
57. Yunnan University, Kunming, China, Nov 2016.
56. Colorado State University, Fort Collins, CO, Oct 2016.
55. Zhejiang University, Hangzhou, China, Oct 2016.
54. Lanzhou University, Lanzhou, China, September 2016.
53. Northwest Normal University, Lanzhou, China, Sept 2016.
52. Japan Advanced Institute of Science and Technology, Nomi, Japan, June 2016.

51. Jilin University, Changchun, China, June 2016.
50. Northwestern Polytechnical University, Xi'an, China, May 2016.
49. Institute of Chemistry, Chinese Academy of Sciences (ICCAS), Beijing, China, May 2016.
48. National Center for Nanoscience and Technology, Beijing, China, May 2016.
47. Peking University, Beijing, China, Nov 2015.
46. Xi'an Jiaotong University, Xi'an, China, Nov 2015.
45. Kunming University of Science and Technology, Kunming, China, Nov 2015.
44. Shanghai Institute of Applied Physics, Chinese Academy of Sciences, Shanghai, China, Nov 2015.
43. Fudan University, Shanghai, China, July 2015.
42. National Center for Nanoscience and Technology, Beijing, China, July 2015.
41. Institute for Molecular Science, National Institutes of Natural Sciences, Okazaki, Japan, July 2015.
40. Shanghai Institute of Organic Chemistry (SIOC), Shanghai, China, July 2015.
39. Yunnan University, Kunming, China, July 2015.
38. École polytechnique fédérale de Lausanne (EPFL), Lausanne, Switzerland, May 2015.
37. ETH Zürich, Zürich, Swtizerland, March 2015.
36. Emory University, Atlanta, GA, USA, February 2015.
35. University of Texas, Dallas, TX, USA, February 2015.
34. Tsinghua University, Beijing, China, Dec 2014.
33. Harbin Institute of Technology, Harbin, China, Dec 2014.
32. Beijing Normal University, Beijing, China, June 2014.
31. Peking University, Beijing, China, Dec 2013.
30. Jilin University, Changchun, Jilin, China, Dec 2013.
29. Texas A&M University, College Station, TX, USA, Oct 2013.
28. Kyoto University, Kyoto, Japan, July 2013.
27. South China University of Technology, Guangzhou, China, July 2013.
26. University of Utah, Salt Lake City, UT, USA, Apr 2013.
25. University of Texas, Austin, TX, USA, Mar 2013.
24. Southern Illinois University, Carbondale, IL, USA, Mar 2013.
23. Cornell University, Ithaca, NY, USA, Feb 2013.
22. Columbia University, New York, NY, USA, Jan 2013.ri
21. University of Chicago, Chicago, IL, USA, Jan 2013.
20. Northwestern University, Evanston, IL, USA, Jan 2013.
19. University of Michigan, Ann Arbor, MI, USA, Nov 2012.
18. Univ. of New Mexico, Albuquerque, NM, USA, Nov 2012.
17. University of California at Irvine, Irvine, CA, USA, Oct 2012.

16. University of California at Berkeley, Berkeley, CA, USA, Oct 2012.
15. University of Illinois at Urbana-Champaign (UIUC), Urbana, IL, USA, Sept 2012.
14. University of Maryland, College Park, MD, USA, Sept 2012.
13. Johns Hopkins University, Baltimore, MD, USA, Sept 2012.
12. Northwestern Polytechnical University, Xi'an, China, May 2012.
11. Dalian University of Technology, Dalian, China, May 2012.
10. Colorado State University, Fort Collins, CO, USA, April 2012.
9. Carbon Capture Workshop, Boulder, CO, USA, Oct 2011.
8. Fort Lewis College, Durango, CO, USA, Sept 2011.
7. Heilongjiang University, Harbin, China, June 2011.
6. Jilin University, Changchun, China, June 2011.
5. University of South Dakota, SD, USA, Nov 2010.
4. Department of Mechanical Engineering, University of Colorado, CO, USA, April 2010.
3. Liquid Crystal Materials Research Center (LCMRC), University of Colorado, CO, USA, April 2009.

(c) Invited Lecture at National Laboratories

2. Oak Ridge National Laboratory, Oak Ridge, TN, USA, June 2013.

(d) Invited Lectures at Companies

1. 3M Company, St. Paul, MN, USA, Oct 2012 and May 2014.

PROFESSIONAL SERVICE

- Local host for the 41st National Organic Chemistry Symposium (NOS), Boulder, 2009.
- Symposium session chair on 241st, 242nd, 244th and 246th ACS National Meetings.
- Faculty representative on the special workshop designed for postdocs seeking a faculty position in academia, ACS Division of Graduate Education, August, 2011.
- Organizer for the special symposium on "Design and Applications of Organic and Metal-Organic Porous Materials", 244th ACS National Meeting, Philadelphia, PA, August 2012.
- Organizer for the special symposium on "Frontiers of Organic Porous Materials: Structures, Properties, and Applications" to be held at Pacifichem2015, Honolulu, HI, USA, December 2015.
- Editor for the book on "Dynamic Covalent Chemistry: Principles, Reactions, and Applications" that will be published by John Wiley & Sons, Inc. in 2017.
- Served as reviewer for NSF, ACS PRF, USDA, ASEE, and Hong Kong RGC grant proposals, NSF panelist, reviewer for international scientific journals, such as *Nature*, *Nature Chemistry*, *Nature Communications*, *Journal of American Chemical Society*, *Angewandte Chemie*, *Chemical Society Review, Advanced Materials*, *Chemical Science*, *ACS Nano*, *Chemistry of Materials*, *Macromolecules*, *Chemistry-A European Journal,* etc.

AFFILIATIONS

American Chemical Society, Materials Research Society