

Xiaodong Michael Shi

Bennett Department of Chemistry	Phone:	304-293-0179
West Virginia University	Fax:	304-293-4904
Morgantown, WV 26506	Email:	Xiaodong.Shi@mail.wvu.edu
Website:	http://community.wvu.edu/~xs007/	

Education:

- 2002 - 2005 Postdoctoral Research Associate, University of California, Berkeley
Mentors: Dr. Paul Bartlett, Dr. Dean Toste
- 1998 - 2002 Ph.D. Department of Chemistry, University of Maryland, College Park
Mentor: Dr. Jeffery T. Davis
- 1994 - 1997 MS, Department of Chemistry, Nankai University, China
- 1990 - 1994 BS, Department of Chemistry, Nankai University, China

Professional Experience:

- 2011 - now Associate Professor, Department of Chemistry, West Virginia University
- 2005 - 2011 Assistant Professor, Department of Chemistry, West Virginia University
- 2005 Platform Research Scientist, General Electric Advanced Material

Publications:

Independent research: 60 publications since 2007 from Independent career

- (61) Ye, X.; Shi, X.* "Palladium Catalyzed Aerobic Oxidative C-H Olefination with Removable 1, 2, 3-Triazole Directing Group" *Org. Lett.* **2014**, *16*, Accepted.
- (60) Xi, Y.; Su, Y.; Yu, Z.; Dong, B.; McClain, E. J.; Lan, Y.*; Shi, X.* "Chemoselective Carbophilic Addition of α -Diazoesters through Ligand-Controlled Gold Catalysis" *Angew. Chem. Int. Ed.* **2014**, *53*, Accepted. DOI: 10.1002/anie.201404946R1.
- (59) Senty, T. R.; Yalamanchi, M.; Zhang, Y.; Cushing, S. K.; Seehra, M. S.; Shi, X.; Bristow, A. D.* "Photoluminescence spectroscopy of YVO₄:Eu³⁺ nanoparticles with aromatic linker molecules: a precursor to biomedical functionalization" *J. Appl. Phys.* **2014**, *115*, 163107.
- (58) Feng, P.; Sun, X.; Su, Y.; Li, X.; Zhang, L.; Shi, X.*; Jiao, N.* "Ceric Ammonium Nitrate (CAN) Catalyzed Modification of Ketones via Two C-C Bond Cleavages with the Retention of the Oxo-Group" *Org. Lett.* **2014**, *16*, 3388-3391.
- (57) Gautam, L. N.; Su, Y.; R.; Akhmedov, N. G.; Petersen, J. L.; Shi, X.* "Asymmetric synthesis of substituted NH-piperidines from chiral amines" *Org. Biomol. Chem.* **2014**, *12*, ASAP.
- (56) Cai, R.; Dawei Wang, D.; Chen, Y.; Yan, W.; Geise, N. R.; Sharma, S.; Li, H.; Petersen, J. L.; Li, M.; Shi, X.* "Facile Synthesis of Fluorescent Active Triazapentalene through Gold-Catalyzed Triazole-Alkyne Cyclization" *Chem. Commun.* **2014**, *50*, 7303-7305.
- (55) Su, Y.; Zhang, Y.; Akhmedov, N. G.; Petersen, J. L.; Shi, X.* "Ambient Intermolecular [2 + 2] Cycloaddition: An Example of Carbophilicity and

- Oxophilicity Competition in Au/Ag Catalysis" *Org. Lett.* **2014**, *16*, 2478-2481.
- (54) Wang, Q.; Motika, S. E.; Akhmedov, N. G.; Petersen, J. L.; Shi, X.* "Synthesis of Cyclic Amine Borane Through Triazole-Gold(I) Catalyzed Alkyne Hydroboration" *Angew. Chem. Int. Ed.* **2014**, *53*, 5418-5422.
- (53) Xi, Y.; Dong, B.; McClain, E. J.; Wang, Q.; Gregg, T. L.; Akhmedov, N. G.; Petersen, J. L.; Shi, X.* "Gold-Catalyzed Intermolecular C-S Bond Formation: Efficient Synthesis of α -Substituted Vinyl Sulfones" *Angew. Chem. Int. Ed.* **2014**, *53*, 4657-4661.
- (52) Su, Y.; Lu, M.; Dong, B.; Chen, H.*; Shi, X.* "Silver Catalyzed Alkyne Activation: the Surprising Ligand Effect" *Adv. Syn. Cat.* **2014**, *356*, 692-696.
- (51) Xi, Y.; Wang, Q.; Su, Y.; Li, M.*; Shi, X.* "Quantitative Kinetic Investigation of Triazole-Gold(I) Complex Catalyzed [3,3]-Rearrangement of Propargyl Ester" *Chem. Commun.* **2014**, *50*, 2158-2160.
- (50) Xi, Y.; Wang, D.; Ye, X.; Akhmedov, N. G.; Petersen, J. L.; Shi, X.* "Synergistic Au/Ga Catalysis in Ambient Nakamura Reaction" *Org. Lett.* **2014**, *16*, 306-309.
- (49) Chen, Y.*; Zhou, S.; Ma, S.; Liu, W.; Pan, Z.; Shi, X.* "A facile synthesis of 5-amino-[1,2,3]triazolo[5,1-a]isoquinoline derivatives through copper-catalyzed cascade reactions" *Org. Biomol. Chem.* **2013**, *11*, 8171-8174.
- (48) Gao, W.; Cai, R.; Meng, L.; Wojtas, L.; Zhou, W.; Yildirim, T.; Shi, X.*; Ma, S.* "Quest for a highly connected robust porous metal-organic framework on the basis of a bifunctional linear linker and a rare heptanuclear zinc cluster" *Chem. Commun.* **2013**, *49*, 10516-10518.
- (47) Xi, Y.; Dong, B.; Shi, X.* "Ambient gold-catalyzed O-vinylation of cyclic 1,3-diketone: A vinyl ether synthesis" *Beilstein J. Org. Chem.* **2013**, *9*, 2537-2543.
- (46) Xi, Y.; Shi, X.* "Cinchonine and thiourea" *Chem. Commun.* **2013**, *49*, 8583-8585.
- (45) Ye, X.; He, Z.; Ahmed, T.; Weise, K.; Ahkmedov, N. G.; Petersen, J. L.; Shi, X.* "1,2,3-Triazoles as Versatile Directing Group for Selective sp^2 and sp^3 C-H Activation: Cyclization vs Substitution" *Chem. Sci.* **2013**, *4*, 3712-3716.
- (44) Wang, K.; Chen, M.; Wang, Q.; Shi, X.*; Lee, J. K.* "1,2,3-Triazoles: Gas Phase Properties" *J. Org. Chem.* **2013**, *78*, 7249-7258.
- (43) Ma, Z.; Sun, W.; Chen, L.; Li, J.; Liu, Z.; Bai, H.; Zhu, M.; Du, L.; Shi, X.; Li, M.* "A novel hydrazino-substituted naphthalimide-based fluorogenic probe for tert-butoxy radicals" *Chem. Commun.* **2013**, *49*, 6295-6297.
- (42) Yan, W.; Shi, X.*; Zhong, C.* "Secondary Amine as Lewis Base in Nitroalkene Activation" *Asian. J. Org. Chem.* **2013**, *2*, 904-914.
- (41) Gautam, L. N.; Wang, Q.; Akhmedov, N. G.; Petersen, J. L.; Shi, X.* "Stereoselective synthesis of N-heterocycles through amine addition to nitroalkenes" *Org. Biomol. Chem.* **2013**, *17*, 1917-1920.
- (40) Wang, C.; Wang, Y.; Xu, L.; Shi, X.; Li, X.; Xu, X.; Sun, H.; Yang, B.; Lin, Q.* "A Galvanic Replacement Route to Prepare Strongly Fluorescent and Highly Stable Gold Nanodots for Cellular Imaging" *Small*, **2013**, *9*, 413-420.
- (39) Wang, L.; Zhang, J.; Sun, J.; Zhu, L.; Zhang, H.; Liu, F.; Zheng, D.; Meng, X.; Shi, X.*; Xiao, F.* "Copper-Incorporated Porous Polydivinylbenzene as Efficient and Recyclable Heterogeneous Catalyst in Ullmann Biaryl Ether Coupling" *ChemCatChem*, **2013**, *5*, 1606-1613.
- (38) Gao, W.; Yan, W.; Cai, R.; Williams, K.; Salas A.; Wojtas, L.; Shi, X.*; Ma, S.* "A

- pillared metal-organic framework incorporated with 1,2,3-triazole moieties exhibiting remarkable enhancement of CO₂ uptake" *Chem. Commun.* **2012**, *48*, 8898-8900.
- (37) Wang, D.; Rong, C.; Sharma, S.; Jirak, J.; Thummanapelli, S. K.; Akhmedov, N. G.; Zhang, H.; Liu, X.; Petersen, J. L.; Shi, X.* " 'Silver Effect' in Gold(I) Catalysis: An overlooked Important Factor" *J. Am. Chem. Soc.* **2012**, *134*, 9012-9019.
- (36) He, W.; Zhang, F.; Shi, X.*; Li, H.* "Ordered Mesoporous Proline Organocatalyst with High Activity and Strong Durability in Promoting Intermolecular Cross-Conjugated Additions" *Eur. J. Org. Chem.* **2012**, *20*, 3753-3758.
- (35) Yan, W.; Ye, X.; Akhmedov, N. G.; Petersen, J. L.; Shi, X.* "1,2,3-Triazole: Unique Ligand in Promoting Iron-Catalyzed Propargyl Alcohol Dehydration" *Org. Lett.* **2012**, *14*, 2358-2361.
- (34) Wang, C.; Xu, L.; Wang, Y.; Zhang, D.; Shi, X.*; Dong, F.; Yu, K.; Lin, Q.*; Yang, B. "Fluorescent Silver Nanoclusters as Effective Probes for Highly Selective Detection of Mercury(II) at Parts-per-Billion Levels" *Chem. Asian. J.* **2012**, *7*, 1652-1654.
- (33) Gao, W.; Yan, W.; Cai, R.; Meng, L.; Salas, A.; Wang, X.; Wojtas, L.; Shi, X.*; Ma, S.* "Porous Double-Walled Metal Triazolate Framework Based upon a Bifunctional Ligand and a Pentanuclear Zinc Cluster Exhibiting Selective CO₂ Uptake" *Inorg. Chem.* **2012**, *51*, 4423-4425.
- (32) Yan, W.; Ye, X.; Weise, K.; Petersen, J. L.; Shi, X.* "Synthesis of allene triazole through iron catalyzed regioselective addition to propargyl alcohols" *Chem. Commun.* **2012**, *48*, 3521-3523.
- (31) Wang, Q.; Aparaj, S.; Akhmedov, N. G.; Petersen, J. L.; Shi, X.* "Ambient Schmittel Cyclization Promoted by Chemoselective Triazole-Gold Catalyst" *Org. Lett.* **2012**, *14*, 1334-1337.
- (30) Wang, D.; Zhang, Y.; Harris, A.; Gautam, L. N. S.; Shi, X.* "Triazole-Gold Promoted Effective Synthesis of Enone from Propargyl-Esters and Alcohols: a Catalyst Offered Chemo-Selectivity, Acidity and Ligand Economy" *Adv. Syn. Cat.* **2011**, *353*, 2584-2588.
- (29) Yan, W.; Liao, T.; Tuguldur, O.; Zhong, C.; Petersen, J. L.; Shi, X.* "Mitsunobu Reaction of the 1,2,3-NH-Triazoles: A regio- and stereo-selective approach in reaching functional triazole derivatives" *Chem. Asian. J.* **2011**, *6*, 2720-2724.
- (28) Li, M.; Wang, Q.; Shi, X.; Hornak, L. A.; Wu, N.* "Detection of Mercury(II) by Quantum Dot/DNA/Gold Nanoparticle Ensemble Based Nanosensor Via Nanometal Surface Energy Transfer" *Anal. Chem.* **2011**, *83*, 7061-7065.
- (27) Wang, D.; Zhang, Y.; Cai, R.; Shi, X.* "Triazole-Au(I) Complex as Chemoselective Catalyst in Promoting Propargyl Ester Rearrangements" *Beilstein J. Org. Chem.* **2011**, *7*, 1014-1020.
- (26) Li, M.; Cushing, S. K.; Wang, Q.; Shi, X.; Hornak, L. A.; Hong, Z.; Wu, N.* "Size-Dependent Energy Transfer between CdSe/ZnS Quantum Dots and Gold Nanoparticles" *J. Phys. Chem. Lett.* **2011**, *2*, 2125-2129.
- (25) Wang, D.; Gautam, L. N. S.; Bollinger, C.; Harris, A.; Li, M.; Shi, X.* "1,2,3-Triazole Bound Au(I) (TA-Au) as Chemoselective Catalysts in Promoting Asymmetric Synthesis of Substituted Allenes" *Org. Lett.* **2011**, *13*, 2618-2621.
- (24) Yan, W.; Wang, Q.; Lin, Q.; Li, M.; Petersen, J. L.; Shi, X.* "N-2-Aryl-1,2,3-

- Triazoles: A New Class of UV-Blue Emitting Fluorophores with Tunable Optical Properties" *Chem. Eur. J.* **2011**, *17*, 5011-5018.
- (23) Zhong, C.; Gautam, L. N. S.; Wang, D.; Akhmedov, N.; Petersen, J. L.; Shi, X.* "Amine Nucleophilic Addition to Nitroalkene as a New Practical Approach for the Synthesis of Fully Substituted Isoxazoline-N-Oxide" *Tetrahedron* **2011**, *67*, 4402-4411.
- (22) Yan, W.; Wang, Q.; Chen, Y.; Petersen, J. L.; Shi, X.* "Iron Catalyzed C-O Bond Activation for the Synthesis of Propargyl-1,2,3-Triazoles and 1,1-Bis-Triazoles" *Org. Lett.* **2010**, *12*, 3308-3311.
- (21) Chen, Y.; Wang, D.; Petersen, J. L.; Akhmedov, N.; Shi, X.* "Synthesis and Characterization of Organogold Complexes Containing Acid Stable Au-C bond through Triazole-yne 5-Endo-Dig Cyclization" *Chem. Commun.* **2010**, *46*, 6147 - 6149.
- (20) Zhong, C.; Gautam, L. N. S.; Petersen, J. L.; Akhmedov, N.; Shi, X.* "Concise Asymmetric Synthesis of Fully Substituted Isoxazoline-N-Oxide through Lewis Base Catalyzed Nitroalkene Activation" *Chem. Eur. J.* **2010**, *16*, 8605-8609.
- (19) Sengupta, S.; Shi, X.* "Recent Advances in Asymmetric Gold Catalysis" *ChemCatChem* **2010**, *2*, 609-619.
- (18) Zhong, C.; Shi, X.* "When Organocatalysis Meets Transition Metal Catalysis" *Eur. J. Org. Chem.* **2010**, 2999-3025.
- (17) Wang, D.; Ye, X.; Shi, X.* "Efficient Synthesis of E- α -Haloenones Through Chemoselective Alkyne Activation Over Allene with Triazole-Au Catalysts" *Org. Lett.* **2010**, *12*, 2088-2091.
- (16) Zhong, C.; Liao, T.; Tuguldur, O.; Shi, X.* "One-Pot Synthesis of Substituted Dihydrofurans from Lewis Base-Catalyzed Three-Component Condensation" *Org. Lett.* **2010**, *12*, 2064-2067.
- (15) Chen, Y.; Yan, W.; Akhmedov, N.; Shi, X.* "1,2,3-Triazole as Special "X-Factor" in Promoting Hashmi Phenol Synthesis" *Org. Lett.* **2010**, *12*, 344-347.
- (14) Liao, W.; Chen, Y.; Duan, H.; Liu, Y.; Petersen, J. L.; Shi, X.* "1,2,3-Triazoleboranes: stable and efficient reagents for ketone and aldehyde reductive amination in organic solvents or in water" *Chem. Commun.* **2009**, 6436-6438.
- (13) Chen, Y.; Zhong, C.; Sun, X.; Akhmedov, N.; Petersen, J. L.; Shi, X.* "One-pot cascade Michael-Michael-Aldol condensation for diastereoselective synthesis of nitro-substituted cyclohexanes" *Chem. Commun.* **2009**, 5150-5152.
- (12) Duan, H.; Sengupta, S.; Petersen, J. L.; Akhmedov, N.; Shi, X.* "Triazole-Au(I) Complexes: A New Class of Catalysts with Improved Thermal Stability and Reactivity for Intermolecular Alkyne Hydroamination" *J. Am. Chem. Soc.* **2009**, *131*, 12100-12102.
- (11) Chen, Y.; Zhong, C.; Petersen, J. L.; Akhmedov, N.; Shi, X.* "One-Pot Asymmetric Synthesis of Substituted Piperidines by Exocyclic Chirality Induction" *Org. Lett.* **2009**, 2333-2336.
- (10) Duan, H.; Yan, W.; Sengupta, S.; Shi, X.* "Highly efficient synthesis of vinyl substituted triazoles by Au(I) catalyzed alkyne activation" *Bioorg. Med. Chem. Lett.* **2009**, 3899-3902.
- (9) Duan, H.; Sengupta, S.; Petersen, J. L.; Shi, X.* "Synthesis and Characterization of NH-triazole-Bound Rhodium(I) Complexes: Substituted-Group-Controlled

- Regioselective Coordination" *Organometallic* **2009**, *28*, 2352-2355.
- (8) Zhong, C.; Chen, Y.; Petersen, J. L.; Akhmedov, N.; Shi, X.* "Enantioselective Intermolecular Crossed-Conjugate Additions between Nitroalkenes and α,β -Enals through a Dual Activation Strategy" *Angew. Chem. Int. Ed.* **2009**, *48*, 1279-1282.
 - (7) Liu, Y.; Yan, W.; Chen, Y.; Petersen, J. L.; Shi, X.* "Efficient Synthesis of N-2-Aryl-1,2,3-Triazole Fluorophores via Post-Triazole Arylation" *Org. Lett.* **2008**, *10*, 5389-5392.
 - (6) Duan, H.; Sun, X.; Liao, W.; Petersen, J. L.; Shi, X.* "Proline as Lewis Base Catalyst: Diastereoselective Synthesis of Isoxazoline-N-oxide through [3 + 2] Cycloaddition" *Org. Lett.* **2008**, *10*, 4113-4116.
 - (5) Chen, Y.; Liu, Y.; Petersen, J. L.; Shi, X.* "Conformational control in the regioselective synthesis of N-2-substituted-1,2,3-triazoles" *Chem. Commun.* **2008**, 3254-3256.
 - (4) Sengupta, S.; Duan, H.; Lu, W.; Petersen, J. L.; Shi, X.* "An Organo-Catalyst Promoted Synthesis of 4,5-Disubstituted-1,2,3-(NH)-Triazoles" *Org. Lett.* **2008**, *10*, 1493-1496.
 - (3) Sun, X.; Sengupta, S.; Petersen, J. L.; Wang, H.; Lewis, J.; Shi, X.* "Intermolecular Rauhut-Currier Reaction between Nitro and Carbonyl Activated Olefins as a New, Efficient Approach for C-C Bond Formation", *Org. Lett.* **2007**, *9*, 4495-4498.
 - (2) Lu, W.; Sengupta, S.; Petersen, J. L.; Akhmedov, N. G.; Shi, X.* "Mitsunobu Coupling of Nucleobases and Alcohols: An Efficient, Practical Synthesis for Novel Non-sugar Carbon Nucleosides", *J. Org. Chem.* **2007**, *72*, 5012-5015.
 - (1) Zhong, C.; Wang, J.; Wu, N.; Wu, G.; Shi, X.* "Anion Bridged Nano-Sheet from Self-Assembled G-Quadruplexes", *Chem. Commun.* **2007**, 3148 - 3150.

Prior to WVU

- (16) Shi, X.; Gorin, D. J.; Toste, F. D. *J. Am. Chem. Soc.* **2005**, *127*, 5802-5803.
- (15) Leeuwen, F. W. B.; Verboom, W.; Shi, X.; Davis, J. T.; Reinhoudt, D. N. *J. Am. Chem. Soc.* **2004**, *126*, 16575-16581.
- (14) Shi, X.; Mullaugh, K. M.; Fettinger, J. C.; Jiang, Y.; Hofstadler, S. A.; Davis, J. T. *J. Am. Chem. Soc.* **2003**, *125*, 10830-10841.
- (13) Cai, M. M.; Shi, X.; Sidorov, V.; Fabris, D.; Lam, Y.; Davis, J. D. *Tetrahedron* **2002**, *58*, 661-671. *40*, 2827-2931.
- (12) Shi, X.; Fettinger, J. C.; Davis, J. T. *Angew. Chem. Int. Ed. Engl.* **2001**, *40*, 2827-2931.
- (11) Shi, X.; Fettinger, J. C.; Davis, J. T. *J. Am. Chem. Soc.* **2001**, *123*, 6738-6739.
- (10) Shi, X.; Fettinger, J. C.; Cai, M. M.; Davis, J. T. *Angew. Chem. Int. Ed. Engl.* **2000**, *39*, 3124-3127.
- (9) Chen, H.; Qian, D. Q.; Xu, G. X.; Liu, Y. X.; Chen, X. D.; Shi, X. D.; Cao, R. Z.; Liu, L. Z. *Phosphorus Sulfur Silicon Relat. Elem.* **1999**, *146*, 85-88.
- (8) Qian, D. Q.; Shi, X. D.; Cao, R. Z.; Liu, L. Z. *Heteroatom Chem.* **1999**, *10*, 271-276.
- (7) Chen, H.; Qian, D. Q.; Xu, G. X.; Liu, Y. X.; Chen, X. D.; Shi, X. D.; Cao, R. Z.; Liu, L. Z. *Synth. Commun.* **1999**, *29*, 4025-4033.
- (6) Liu, L. Z.; Cao, R. Z.; Shi, X. D.; Qian, D. Q. *Chem. J. Chin. Univ. Chin.* **1998**, *19*, 748-753.
- (5) Qian, D. Q.; Shi, X. D.; Cao, R. Z.; Liu, L. Z. *Tetrahedron Lett.* **1997**, *38*, 6245-6246.

- (4) Qian, D. Q.; Zeng, X. Z.; **Shi, X. D.**; Cao, R. Z.; Liu, L. Z. *Heteroatom Chem.* **1997**, *8*, 517-520.
- (3) Cao, R. Z.; Cui, S.; **Shi, X. D.**; Fu, L. B.; Liu, L. Z.; Li, G. W. *Phosphorus Sulfur Silicon Relat. Elem.* **1996**, *113*, 123-129.
- (2) Liu, L. Z.; **Shi, X. D.**; Cao, R. Z. *Chin. Chem. Lett.*, **1994**, *5*, 725-726.
- (1) **Shi, X. D.**; Cao, R. Z.; Liu, L. Z.; *Chin. Chem. Lett.*, **1994**, *5*, 815-816.

Honors and Awards:

- NSF Career award (2009)
- Outstanding Faculty Award, Department of Chemistry, West Virginia University (2009, 2011)
- Outstanding Research Assistant Awards from University of Maryland (2002)

Affiliations:

American Chemical Society (Since 1997)
Chinese-American Chemistry Professor Association