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Education

Ph.D, Chemistry, Brown University **2009-2013**
Advisor: Shouheng Sun

B.S., Polymer Chemistry, University of Science and Technology of China **2004-2008**
Advisor: Shu-Hong Yu

Work Experience

Assistant Professor **2016.08 – present**
Department of Chemistry, University of Virginia, Charlottesville, VA

Postdoctoral Research Associate **2016.06 – 2016.08**
Chemical Sciences Division, Oak Ridge National Laboratory, Knoxville, TN, USA
Advisor: Sheng Dai

NatureNet Science Postdoctoral Fellow **2013.08 – 2016.03**
Department of Chemistry, University of Pennsylvania, Philadelphia, PA, USA
Advisor: Christopher B. Murray

Awards and Honors

2022 NSF CAREER Award, *US National Science Foundation*

2021 Research Excellence Award, *University of Virginia*

2021 Scialog Collaborative Innovation Award, *Research Corporation for Science Advancement and Alfred P. Sloan Foundation*

2020 Scialog Fellow for Negative Emissions Science, *Research Corporation for Science Advancement and Alfred P. Sloan Foundation*

2020 Rising Star 2020, *Frontiers in Chemistry, Frontiers*

2020 Emerging Investigator, *Nanoscale, The Royal Society of Chemistry*

2019 Emerging Investigator, *Journal of Materials Chemistry A, The Royal Society of Chemistry*

2019 Sustainability Course Development Fellowship, *University of Virginia*

2014 Potter Prize for the Outstanding Ph.D. Thesis, *Brown University*

2013-2016 NatureNet Postdoctoral Fellowship, *The Nature Conservancy*

Teaching

Chem 1811: Principles of Chemical Structure Laboratory (Accelerated)
Fall 2018, Fall 2019, Fall 2021

Chem 5340: Nanomaterials: Synthesis, Properties, and Applications
Fall 2016, Fall 2017, Spring 2019, Spring 2020, Spring 2021

Chem 5559: Chemistry for Energy Future
Spring 2018

Journal Publications

* corresponding author, § co-first author [Google Scholar](#)

Published Since Joining UVA

66. Chang Liu[§], Jin Qian[§], Yifan Ye, Hua Zhou, Cheng-Jun Sun, Colton Sheehan, Zhiyong Zhang, Gang Wan, Yi-Sheng Liu, Jinghua Guo, Shuang Li, Hye-Young Shin, Sooyeon Hwang, T. Brent Gunnoe,

- William A. Goddard III*, **Sen Zhang***, "Oxygen Evolution Reaction over Co Catalytic Single-Site in a Well-Defined Brookite TiO₂ Nanorod Surface", *Nature Catal.* **2021**, *4*, 36-45.
65. Perrin Godbold, Grayson Johnson, Akachukwu D. Obi, Rebecca Brown, Robert Gilliard*, **Sen Zhang***, "Surfactant Removal for Colloidal Nanocrystal Catalysts Mediated by N-Heterocyclic Carbene", *J. Am. Chem. Soc.* **2021**, *143*, 2644-2648.
64. Chang Liu[§], Ana Geer[§], Chris Webber, Charles Musgrave, Shunyan Gu, Grayson Johnson, Diane A. Dickie, Sonia Chabbra, Alexander Schnegg, Hua Zhou, Cheng-Jun Sun, Sooyeon Hwang, William A. Goddard III*, **Sen Zhang***, T. Brent Gunnoe*, "Immobilization of "Capping Arene" Cobalt(II) Complexes on Ordered Mesoporous Carbon for Electrocatalytic Water Oxidation", *ACS Catal.* **2021**, *11*, 15068-15082
63. Lili Lin, Jinjia Liu, Xi Liu*, Zirui Gao, Rui Ning, Siyu Yao, Feng Zhang, Maolin Wang, Chang Liu, Lili Han, Feng Yang, **Sen Zhang**, Xiao-dong Wen, Sanjaya D. Senanayake, Yichao Wu, Xiaonian Li, Jose A. Rodriguez*, Ding Ma*, "Reversing sintering effect of Ni particles on γ -Mo₂N via strong metal support interaction", *Nature Comm.* **2021**, *12*, 6978.
62. John T. Brosnahan, Zhiyong Zhang, Zhouyang Yin, **Sen Zhang***, "Electrocatalytic Hydrogenation of Furfuraldehyde with High Selectivity to Furfuryl Alcohol using AgPd Alloy Nanoparticles", *Nanoscale* **2021**, *13*, 2312-2316 (Emerging Investigator Themed Issue).
61. Ana M. Geer, Robert J. Nielsen, Bradley A. McKeown, Chang Liu, Xiaofan Jia, Diane A. Dickie, Charles W. Machan, **Sen Zhang**, William A. Goddard III*, T. Brent Gunnoe*, "Electrocatalytic Water Oxidation by a Trinuclear Copper(II) Complex", *ACS Catalysis.* **2021**, *11*, 7223-7240.
60. Ana M. Geer[§], Chang Liu[§], Charles Musgrave, Christopher Webber, Grayson Johnson, Hua Zhou, Cheng-Jun Sun, Diane A. Dickie, William A. Goddard III*, **Sen Zhang***, T. Brent Gunnoe*, "Non-covalent Immobilization of Pentamethylcyclopentadienyl Iridium Complexes on Ordered Mesoporous Carbon for Electrocatalytic Water Oxidation", *Small Science* **2021**, *1*, 2100037.
59. Guangming Jiang*, Xuelin Shi, Meiyang Cui, Weilu Wang, Peng Wang, Grayson Johnson, Yudong Nie, Xiaoshu Lv, Xianming Zhang, Fan Dong, Sen Zhang, "Surface Ligand Environment Boosts the Electrocatalytic Hydrodechlorination Reaction on Palladium Nanoparticles" *ACS Appl. Mater. Interfaces* **2021**, *13*, 4072-4083.
58. Lili Lin*, Clifford A. Gerlak, Chang Liu, Jordi Llorca, Siyu Yao, Ning Rui, Feng Zhang, Zongyuan Liu, **Sen Zhang**, Christopher B. Murray, José A. Rodriguez, Sanjaya D. Senanayake*, "Effect of Ni Particle Size on the Production of Renewable Methane from CO₂ over Ni/CeO₂ Catalyst", *J. Energy. Chem.* **2021**, *61*, 602-611.
57. Yulu Zhang, Na Li, Zhiyong Zhang, Shuang Li, Meiyang Cui, Lu Ma, Hua Zhou, Dong Su, **Sen Zhang***, "Programmable Synthesis of Multimetallic Phosphide Nanorods Mediated by Core/Shell Structure Formation and Conversion", *J. Am. Chem. Soc.* **2020**, *142*, 8490-8497.
56. Xiaowen Hu[§], Chang Liu[§], Zhiyong Zhang, Qiumei Nie, Xiaofang Jiang*, Juan Garcia, Colton Sheehan, Lingling Shui, Shashank Priya, Guofu Zhou,* **Sen Zhang***, Kai Wang*, "22% Efficiency Inverted Perovskite Photovoltaic Cell using Cation-Doped Brookite TiO_x Top Buffer", *Adv. Sci.* **2020**, *7*, 2001285.
55. Meiyang Cui, Grayson Johnson, Zhiyong Zhang, Shuang Li, Sooyeon Hwang, Xu Zhang, **Sen Zhang***, "AgPd Nanoparticles for the Electrocatalytic CO₂ Reduction: Bimetallic Composition-Dependent Ligand and Ensemble Effects", *Nanoscale* **2020**, *12*, 14068-14075.
54. Zhongwen Luo, Colby A. Whitcomb, Nicholas Kaylor, Yulu Zhang, **Sen Zhang**, Robert J. Davis*, T. Brent Gunnoe*, "Oxidative Alkenylation of Arenes Using Supported Rh Materials: Evidence that Active Catalysts are Formed by Rh Leaching", *ChemCatChem* **2020**, *13*, 260-270.
53. Chang Liu, Xiaochen Shen, Grayson Johnson, Yulu Zhang, Changlin Zhang, Jiafu Chen, Lingyan Li, Colton Sheehan, Zhenmeng Peng*, **Sen Zhang***, "Two-Dimensional Metal-Organic Framework Nanosheets as Bifunctional Catalyst for Electrochemical and Photoelectrochemical Water Oxidation", *Frontiers in Chemistry*, **2020**, *8*, 604239. (Rising Stars 2020 Themed Issue).
52. Fanji Kong, Shunyan Gu, Chang Liu, Diane A. Dickie, **Sen Zhang**, T. Brent Gunnoe*, "Effects of Additives on Catalytic Arene C-H Activation: Study of Rh Catalysts Supported by Bis-phosphine Pincer Ligands", *Organometallics* **2020**, *39*, 3918-3935.
51. Qiang Gao, Tianyou Mou, Shikai Liu, Grayson Johnson, Xue Han, Zihao Yan, Mengxia Ji, Qian He, **Sen Zhang**, Hongliang Xin*, Huiyuan Zhu*, "Monodisperse PdSn/SnO_x core/shell nanoparticles with superior electrocatalytic ethanol oxidation performance", *J. Mater. Chem. A* **2020**, *8*, 20931-20938.

50. Zhiyong Zhang[§], Qiyuan Wu[§], Grayson Johnson[§], Yifan Ye, Xing Li, Na Li, Meiyang Cui, Jennifer D. Lee, Chang Liu, Shen Zhao, Alexander Orlov, Christopher B. Murray, Xu Zhang, T. Brent Gunnoe, Dong Su*, **Sen Zhang***, "Generalized Synthetic Strategy for Transition Metal Doped Brookite-Phase TiO₂ Nanorods", *J. Am. Chem. Soc.* **2019**, *141*, 16548-16552.
49. Cheng Hao Wu, Chang Liu, Dong Su, Huolin Xin, Haitao Fang, Baran Eren, **Sen Zhang***, Christopher B. Murray*, Miquel B. Salmeron*, "Bimetallic Synergy in Cobalt–Palladium Nanocatalysts for CO Oxidation", *Nature Catal.* **2019**, *2*, 78-85.
48. Yiyin Peng[§], Meiyang Cui[§], Song Shu, Xuelin Shi, John T. Brosnahan, Chang Liu, Yulu Zhang, Perrin Godbold, Xianming Zhang, Fan Dong, Guangming Jiang*, **Sen Zhang***, "Bimetallic Composition-Promoted Electrocatalytic Hydrodechlorination Reaction on Silver-Palladium Alloy Nanoparticles" *ACS Catal.* **2019**, *9*,10803-10811.
47. Zhiyong Zhang, Chang Liu, John T. Brosnahan, Hua Zhou, Wenqian Xu, **Sen Zhang***, "Revealing Structure Evolution of PbS Nanocrystal Catalysts in the Electrochemical CO₂ Reduction Using in situ Synchrotron Radiation X-ray Diffraction", *J. Mater. Chem. A* **2019**, *7*, 23775-23780 (2019 Emerging Investigator Themed Issue)
46. Weihao Zhu, Zhongwen Luo, Junqi Chen, Chang Liu, Lu Yang, Diane A. Dickie, Naiming Liu, **Sen Zhang**, Robert J. Davis, T. Brent Gunnoe* "Mechanistic Studies of Single-Step Styrene Production Catalyzed by Rh Complexes with Dimine Ligands: An Evaluation of the Role of Ligands and Induction Period", *ACS Catal.* **2019**, *9*, 7457-7475.
45. Xiaofan Jia, Aisling M. Foley, Chang Liu, Benjamin A. Vaughan, Bradley A. McKeown, **Sen Zhang**, T. Brent Gunnoe*, "Styrene Production from Benzene and Ethylene Catalyzed by Palladium(II): Enhancement of Selectivity towards Styrene via Temperature Dependent Vinyl Ester Consumption", *Organometallics* **2019**, *38*, 3532-3541.
44. Jing Li, Grayson Johnson, **Sen Zhang**, Dong Su*, "In Situ Transmission Electron Microscopy for Energy Applications", *Joule* **2019**, *3*, 4-8.
43. Mingchuan Luo, Yong Yang, Yingjun Sun, Yingnan Qin, Chunji Li, Yingjie Li, Menggang Li, **Sen Zhang**, Dong Su, Shaojun Guo*, "Ultrathin Two-dimensional Metallic Nanocrystals for Renewable Energy Electrocatalysis", *Mater. Today* **2019**, *23*, 45-56.
42. Zheng Wang, Zhenpeng Huang, John T. Brosnahan, **Sen Zhang**, Yanglong Guo, Yun Guo, Li Wang, Yunsong Wang, Wangcheng Zhan*, "Ru/CeO₂ Catalyst with Optimized CeO₂ Support Morphology and Surface Facets for Propane Combustion", *Environ. Sci. Technol.* **2019**, *53*, 5349-5358.
41. Guangming Jiang, Wenyang Fu, Song Shu, Zhiyong Zhang, **Sen Zhang**, Yuxin Zhang*, Xianming Zhang, Fan Dong, Xiaoshu Lv*, "MgAl Layered Double Oxide: One Powerful Sweeper of Emulsified Water and Acid for Oil Purification", *J. Hazard. Mater.* **2019**, *367*, 658-667.
40. Fan Dong*, Yuxin Zhang*, **Sen Zhang***, "Photocatalysis for Environmental Applications", *Front. Chem.* **2019**, *7*, 303. (Editorial)
39. Chang Liu[§], Zhong Ma[§], Meiyang Cui, Zhiyong Zhang, Xu Zhang, Dong Su, Christopher B. Murray, Jia X. Wang, **Sen Zhang***, "Favorable Core/Shell Interface within Co₂P/Pt Nanorods for Oxygen Reduction Electrocatalysis", *Nano Lett.* **2018**, *18*, 7870-7875.
38. Li An[§], Zhiyong Zhang[§], Jianrui Feng, Fan Lv, Yuxuan Li, Rui Wang, Min Lu, Ram B. Gupta, Pinxian Xi*, **Sen Zhang***, "Heterostructure-Promoted Oxygen Electrocatalysis Enables Rechargeable Zinc-Air Battery with Neutral Aqueous Electrolyte", *J. Am. Chem. Soc.* **2018**, *140*,17624-17631.
37. Qiguang Dai[§], Zhiyong Zhang[§], Jiaorong Yan, Jinyan Wu, Grayson Johnson, Wei Sun, Xingyi Wang, **Sen Zhang***, Wangcheng Zhan*, "Phosphate-Functionalized CeO₂ Nanosheets for Efficient Catalytic Oxidation of Dichloromethane", *Environ. Sci. Technol.* **2018**, *52*, 13430-13437.
36. Jieyuan Li, Zhiyong Zhang, Wen Cui, Hong Wang, Wanglai Cen, Grayson Johnson, Guangming Jiang, **Sen Zhang***, and Fan Dong*, "The Spatially Oriented Charge Flow and Photocatalysis Mechanism on Internal van der Waals Heterostructures Enhanced g-C₃N₄", *ACS Catal.* **2018**, *8*, 8376-8385.
35. Taejong Paik, Matteo Cargnello, Thomas R. Gordon, Sen Zhang, Hongseok Yun, Jennifer D. Lee, Ho Young Woo, Soong Ju Oh, Cherie R. Kagan, Paolo Fornasiero, Christopher B. Murray*, "Photocatalytic Hydrogen Evolution from Substoichiometric Colloidal WO_{3-x} Nanowires", *ACS Energy Lett.* **2018**, *3*, 1904-1910.
34. Guangming Jiang, Kaifeng Wang, Jieyuan Li, Wenyang Fu, Zhiyong Zhang, Grayson Johnson, Xiaoshu Lv, Yuxin Zhang, **Sen Zhang**, Fan Dong*, "Electrocatalytic Hydrodechlorination of 2,4-Dichlorophenol over Palladium Nanoparticles and its pH-Mediated Tug-of-War with Hydrogen Evolution" *Chem. Eng. J.* **2018**, *348*, 26-34.

33. Mengxia Jia, Zhiyong Zhang, Jiexiang Xia*, Jun Di, Yiling Liu, Rong Chen, Sheng Yin, **Sen Zhang***, Huaming Lia*, "Enhanced Photocatalytic Performance of Carbon Quantum Dots/BiOBr Composite and Mechanism Investigation", *Chin. Chem. Lett.* **2018**, 29, 805-810.
32. Guangming Jiang, Wenyang Fu, Yuzheng Wang, Xiaoying Liu, Yuxin Zhang, Fan Dong, Zhiyong Zhang, Xianming Zhang, Yuming Huang, **Sen Zhang**, Xiaoshu Lv*, "Calcium Sulfate Hemihydrate Nanowires: One Robust Material in Separation of Water from Water-in-Oil Emulsion", *Environ. Sci. Technol.* **2017**, 51, 10519–10525.
31. Guangming Jiang*, Mengna Lan, Zhiyong Zhang, Xiaoshu Lv, Zimo Lou, Xinhua Xu, Fan Dong, **Sen Zhang***, "Identification of Active Hydrogen Species on Palladium Nanoparticles for an Enhanced Electrocatalytic Hydrodechlorination of 2,4-Dichlorophenol in Water", *Environ. Sci. Technol.* **2017**, 51, 7599–7605.
30. **Sen Zhang***, Shaojun Guo*, "Green Energy for Green Future" (Editorial), *Green Energy & Environment* **2017**, 2, 65.
29. Guangming Jiang, Xinwei Li, Mengna Lan, Ting Shen, Xiaoshu Lv, Fan Dong*, **Sen Zhang***, "Monodisperse Bismuth Nanoparticles Decorated Graphitic Carbon Nitride: Enhanced Visible-Light-Response Photocatalytic NO Removal and Reaction Pathway", *Appl. Catal., B.* **2017**, 205, 532–540.

Graduate and Postdoctoral Publications

28. Kai He[§], **Sen Zhang[§]**, Jing Li, Xiqian Yu, Qingping Meng, Yizhou Zhu, Enyuan Hu, Ke Sun, Hongseok Yun, Xiao-Qing Yang, Yimei Zhu, Hong Gan, Yifei Mo, Eric A. Stach, Christopher B. Murray*, Dong Su*, "Visualizing Non-Equilibrium Lithiation of Spinel Oxide via in situ Transmission Electron Microscopy", *Nature Comm.* **2016**, 10.1038/ncomms11441.
27. Guangming Jiang, Yuxi Huang, **Sen Zhang**, Huiyuan Zhu, Zhongbiao Wu*, Shouheng Sun*, "Controlled Synthesis of Au–Fe Heterodimer Nanoparticles and Their Conversion into Au–Fe₃O₄ Heterostructured Nanoparticles", *Nanoscale* **2016**, 8, 17947-17952.
26. Guangming Jiang, Junxi Li, Yunliang Nie, **Sen Zhang**, Fan Dong, Baohong Guan*, Xiaoshu Lv*, "Immobilizing Water into Crystal Lattice of Calcium Sulfate for its Separation from Water-in-Oil Emulsion", *Environ. Sci. Technol.* **2016**, 50, 7650–7657.
25. Guangming Jiang, Huiyuan Zhu, Xu Zhang, Bo Shen, Liheng Wu, **Sen Zhang**, Gang Lu, Zhongbiao Wu, Shouheng Sun*, "Core/Shell fct-FePd/Pd Nanoparticles as an Efficient Non-Pt Catalyst for Oxygen Reduction Reaction", *ACS Nano* **2015**, 9, 11014-11022.
24. Vicky V. T. Doan-Nguyen, **Sen Zhang**, Edward B. Trigg, Rahul Agarwal, Karen I. Winey, Christopher B. Murray*, "Synthesis and X-ray Characterization of Cobalt Phosphide Nanorod Electrocatalysts for Oxygen Reduction", *ACS Nano* **2015**, 9, 8108-8115.
23. Guangming Jiang, Qiaoshan Chen, Caiyun Jia, **Sen Zhang**, Zhongbiao Wu, Baohong Guan*, "Controlled Synthesis of Monodisperse α -Calcium Sulfate Hemihydrate Nanoellipsoids with a Porous Structure", *Phys. Chem. Chem. Phys.* **2015**, 17, 11509-11515.
22. Huiyuan Zhu, **Sen Zhang**, Dong Su, Guangming Jiang, Shouheng Sun*, "Surface Profile Control of FeNiPt/Pt Core/Shell Nanowires for Oxygen Reduction Reaction", *Small* **2015**, 17, 11509-11515.
21. Qing Li, Liheng Wu, Gang Wu, Dong Su, Haifeng Lv, **Sen Zhang**, Wenlei Zhu, Anix Casimir, Huiyuan Zhu, Adriana Mendoza-Garcia, and Shouheng Sun*, "New Approach to Fully Ordered fct-FePt Nanoparticles for Much Enhanced Electrocatalysis in Acid", *Nano Lett.* **2015**, 15, 2468-2473.
20. **Sen Zhang**, Yizhou Hao, Dong Su, Vicky V. T. Doan-Nguyen, Yaoting Wu, Jing Li, Shouheng Sun, Christopher B. Murray*, "Monodisperse Core/Shell Ni/FePt Nanoparticles and Their Conversion to Ni/Pt to Catalyze Oxygen Reduction", *J. Am. Chem. Soc.* **2014**, 136, 15921-15924.
19. Huiyuan Zhu,[§] Aruna Sigdel,[§] **Sen Zhang**,[§] Dong Su, Qing Li, Zhen Xi, Shouheng Sun*, "Core/Shell Au/MnO Nanoparticles Prepared Through Controlled Oxidation of AuMn as an Electrocatalyst for Sensitive H₂O₂ Detection", *Angew. Chem. Int. Ed.* **2014**, 126, 12716-12720.
18. Liheng Wu, Pierre-Olivier Jubert, David Berman, Wayne Imano, Alshakim Nelson, Huiyuan Zhu, **Sen Zhang**, Shouheng Sun*, "Monolayer Assembly of Ferrimagnetic Co_xFe_{3-x}O₄ Nanocubes for Magnetic Recording", *Nano Lett.*, **2014**, 14, 3395-3399.
17. **Sen Zhang**, Xu Zhang, Guangming Jiang, Huiyuan Zhu, Shaojun Guo, Dong Su, Gang Lu, Shouheng Sun*, "Tuning Nanoparticle Structure and Surface Strain for Catalysis Optimization", *J. Am. Chem. Soc.* **2014**, 136, 7734-7739.

16. **Sen Zhang**, Guangming Jiang, Gabriel T. Filsinger, Liheng Wu, Huiyuan Zhu, Jonghun Lee, Zhongbiao Wu, Shouheng Sun*, "Halide Ion-Mediated Growth of Single Crystalline Fe Nanoparticles", *Nanoscale* **2014**, 6, 4852-4856.
15. Shaojun Guo[§], **Sen Zhang**[§], Dong Su, Shouheng Sun*, "Seed-Mediated Synthesis of Core/Shell FePtM/FePt (M = Pd, Au) Nanowires and Their Electrocatalysis for Oxygen Reduction Reaction", *J. Am. Chem. Soc.* **2013**, 135, 13879-13884.
14. Huiyuan Zhu[§], **Sen Zhang**[§], Shaojun Guo, Dong Su, Shouheng Sun*, "Synthetic Control of FePtM Nanorods (M = Cu, Ni) to Enhance the Oxygen Reduction Reaction", *J. Am. Chem. Soc.* **2013**, 135, 7170-7173.
13. Huiyuan Zhu, **Sen Zhang**, Yuxi Huang, Liheng Wu, Shouheng Sun*, "Monodisperse $M_xFe_{3-x}O_4$ (M = Fe, Cu, Co, Mn) Nanoparticles and Their Electrocatalysis for Oxygen Reduction Reaction", *Nano Lett.* **2013**, 13, 2947-2951.
12. **Sen Zhang**, Onder Metin, Dong Su, Shouheng Sun*, "Monodisperse AgPd Alloy Nanoparticles and Their Superior Catalytic Activity in Formic Acid Dehydrogenation", *Angew. Chem. Int. Ed.* **2013**, 52, 3681-3684.
11. Shaojun Guo, Dongguo Li, Huiyuan Zhu, **Sen Zhang**, Nenad M. Markovic, Vojislav R. Stamenkovic*, Shouheng Sun*, "MPt (M = Fe, Co) Nanowires as Efficient Catalysts for Oxygen Reduction Reaction", *Angew. Chem. Int. Ed.* **2013**, 52, 3465-3468.
10. Jonghun Lee, **Sen Zhang**, Shouheng Sun*, "High-Temperature Solution-Phase Syntheses of Metal-Oxide Nanocrystals", *Chem. Mater.* **2013**, 25, 1293-1304.
9. Shaojun Guo[§], **Sen Zhang**[§], Shouheng Sun*, "Tuning Nanoparticle Catalysis for Oxygen Reduction Reaction", *Angew. Chem. Inter. Ed.* **2013**, 52, 8526-8544.
8. Shaojun Guo, **Sen Zhang**, Liheng Wu, Shouheng Sun*, "Co/CoO Nanoparticles Assembled on Graphene for Electrochemical Reduction of Oxygen", *Angew. Chem. Int. Ed.* **2012**, 51, 11770-11773.
7. **Sen Zhang**, Shaojun Guo, Huiyuan Zhu, Dong Su, Shouheng Sun*, "Structure-Induced Enhancement in Electrooxidation of Trimetallic FePtAu Nanoparticles", *J. Am. Chem. Soc.* **2012**, 134, 5060-5063.
6. **Sen Zhang**, Jonghun Lee, Shouheng Sun*, "Chemical Synthesis of Monodisperse Magnetic Nanoparticles", *The Open Surface Science Journal* **2012**, 4, 26-34.
5. Shaojun Guo, **Sen Zhang**, Xiaolian Sun, Shouheng Sun*, "Synthesis of Ultrathin FePtPd Nanowires and Their Use as Catalysts for Methanol Oxidation Reaction", *J. Am. Chem. Soc.* **2011**, 133, 15354-15357.
4. **Sen Zhang**, Huiyuan Zhu, Zhi-Bin Hu, Lu Liu, Shaofeng Chen, Shu-Hong Yu*, "Magnetite-Nanoparticles-Attached Necklace-like Cu@Cross-Linked Poly(vinyl alcohol) Microcables: Synthesis, Individual Magnetic Manipulation and Fluorescent Property", *Chem. Comm.* **2009**, 2326-2328.
3. Ming-Jun Hu, Yang Lu, **Sen Zhang**, Shi-Rui Guo, Bin Lin, Meng Zhang, Shu-Hong Yu*, "High Yield Synthesis of Bracelet-like Hydrophilic Ni-Co Magnetic Alloy Flux-Closure Nanorings", *J. Am. Chem. Soc.* **2008**, 130, 11606-11607.
2. Sheng-Liang Zhong, Ji-Ming Song, **Sen Zhang**, An-Wu Xu, Wei-Tang Yao, Shu-Hong Yu*, "Template-free Hydrothermal Synthesis and Formation Mechanism of Hematite Microrings", *J. Phys. Chem. C* **2008**, 112, 19916-19921.
1. Hua Wang, **Sen Zhang**, Mozhen Wang, Xuewu Ge*, "Preparation of Monodisperse Polystyrene Particles from Emulsifier-free Miniemulsion Polymerization", *Chem. Lett.* **2008**, 37, 1158-1159.

Book Chapters

2. **Sen Zhang**, Shouheng Sun, "Chapter 2: Iron Oxide Based Magnetic Nanoparticles for Biological Imaging", *Nanotechnology for Biomedical Imaging and Diagnostics: From Nanoparticle Design to Clinical Applications*, Edited by Mikhail Berezin, John Wiley & Sons, Ltd., October **2014**.
1. Huiyuan Zhu, Yuxi Huang, **Sen Zhang**, Shouheng Sun*, "Rational Design and Controlled Synthesis of Metallic Nanoparticles for Electrocatalysis", *Catalysis by Materials with Well-defined Structures*, Edited by Steve Overbury and Zili Wu, Elsevier BV, **2014**.

Patents

2. "Multimetallic Nanoparticle Catalysts With Enhanced Electrooxidation", With Shouheng Sun, Shaojun Guo, Huiyuan Zhu, Dong Su, **US 909375B2**.
1. "Co/CoO Nanoparticle Composite, Manufacture, and Use in an Electrochemical Cell", With Shouheng Sun, Shaojun Guo, Liheng Wu, **WO2014055485A1**.

Presentations

43. *Seminar*, James Madison University, October 8th, **2021**, Harrisonburg, VA.
42. *Seminar*, University of California, Los Angeles, May 26th, **2021**, Los Angeles, CA.
41. *Seminar*, University of California, Riverside, May 10th, **2021**, Riverside, CA.
40. *Seminar*, Augustana College, March 25th, **2021**, Rock Island, IL.
39. *Seminar*, University of Delaware, March 3rd, **2021**, Newark, DE.
38. *Seminar*, University of Florida, March 1st, **2021**, Gainesville, FL.
37. *Seminar*, Indiana University Bloomington, February 23rd, **2021**, Indiana, IN.
36. *Seminar*, Wesleyan University, February 19th, **2021**, Middletown, CT.
35. *Seminar*, Duke University, November 17th, **2020**, Durham, NC.
34. *Seminar*, North Carolina State University, November 12nd, **2020**, Raleigh, NC.
33. *Seminar*, University of Illinois at Urbana–Champaign, November 10th, **2020**, Urbana–Champaign, IL.
32. *Seminar*, University of North Carolina at Chapel Hill, November 3rd, **2020**, Chapel Hill, NC.
31. *Seminar*, High Point University, Oct 30th, **2020**, High Point, NC.
30. *Seminar*, University of Connecticut, Oct 14th, **2020**, Storrs, CT.
29. *Seminar*, Wayne State University, September 16th, **2019**, Detroit, MI.
28. *Invited talk*, "Precision Synthesis of Well-Defined Nanocrystals for Enhanced Electrocatalysis", Aug 18th, **2020**, ACS COLL Live Stream.
27. *Seminar*, Iowa State University, Jan 17th, **2020**, Ames, IA.
26. *Seminar*, Hampton University, Oct 10th, **2019**, Hampton, VA.
25. *Seminar*, Norfolk State University, Oct 10th, **2019**, Norfolk, VA.
24. *Invited talk*, "Kinetic Control of Nanocrystals and Assembly", Aug 26th, **2019**, 256th ACS National Meeting, San Diego, CA.
23. *Invited talk*, "Multicomponent Cooperation at Nanocrystals Surfaces and Interfaces for Enhanced Electrocatalysis", Apr 3rd, **2019**, 255th ACS National Meeting, Orlando, FL.
22. *Seminar*, Oak Ridge National Laboratory, Dec 20th, **2018**, Oak Ridge, TN.
21. *Invited Talk*, "Controlling Multicomponent Cooperation at Nanocrystals Surfaces and Interfaces for Enhanced Electrocatalysis", American Chemical Society 2018 Fall Meeting, Aug 20th, **2018**, Boston, MA.
20. *Seminar*, Sichuan University, Jun 19, **2018**, Chengdu, China.
19. *Seminar*, Brown University, May 4, **2018**, Providence, RI.
18. *Seminar*, Catawba College, Apr 20, **2018**, Salisbury, NC.
17. *Invited Talk*, "Tuning Core/Shell Interaction Within Nanocrystals for Oxygen Reduction Electrocatalysis" Materials Research Society 2018 Spring Meeting, Apr 6, **2018**, Phoenix, AZ.
16. *Invited talk*, "Core-Shell Nanocrystals: Ligand Effect and Strain Effect for Electrocatalysis", Aug 23rd, **2017**, 254th ACS National Meeting.
15. *Seminar*, US Army Research Laboratory, Mar 29th, **2017**, MD.
14. *Seminar*, Emory University, Jan 21st, **2016**, GA.
13. *Seminar*, University of Virginia, Nov 18th, **2015**, VA.
12. *Seminar*, University of Pittsburgh, Oct 1st, **2015**, PA.
11. *Seminar*, Pacific Northeastern National Laboratory, Aug 13th, **2015**, WA.
10. *Seminar*, Oak Ridge National Laboratory, Aug 10th, **2015**, TN.
9. *Invited talk*, "Synthetic Tuning of Heterostructured Nanoparticles for Electrocatalysis", *American Chemical Society 248th National Meeting*, Aug 14th, **2014**, San Francisco, CA.
8. *Invited talk*, "Developing Nanostructured Materials for Energy Future", Oral presentation, *All Science Meeting, Nature Conservancy*, Dec 10rd, **2013**, San Jose, CA.
7. *Oral presentation*, "Structure-Induced Catalysis Control of FePt Based Multimetallic Nanoparticles for Fuel Cell Reactions", *Materials Research Society Fall Meeting*, Dec 3rd, **2013**, Boston, MA.

6. *Invited talk*, "Rational Synthesis of Metallic Nanoparticles for Catalytic Applications", *American Chemical Society 245th National Meeting*, Apr 11th, **2012**, New Orleans, LA.
5. *Oral presentation*, "Intermetallic FePt-based Binary and Ternary Alloy Nanoparticles: Chemical Synthesis and Electrocatalytic Applications", *Materials Research Society Fall Meeting*, Nov 28th, **2012**, Boston, MA.
4. *Poster presentation*, "Trimetallic Pt-alloy Nanorods as Catalysts for Oxygen Reduction Reaction", *Materials Research Society Fall Meeting*, Nov 27th **2012**, Boston, MA.
3. *Oral presentation*, "Chemical Synthesis of Trimetallic Pt- and Pd-based Nanoparticles and Their Use as Catalysts for Electro-oxidation of Formic Acid/Methanol", *Materials Research Society Fall Meeting*, Nov 27th **2012**, Boston, MA.
2. *Oral presentation*, "Synthesis of Ultrathin FePtPd Nanowires and Their Catalysis for Methanol Oxidation Reaction", *Materials Research Society Spring Meeting*, April 11st **2012**, San Francisco, CA.
1. *Poster presentation*, "Multimetallic Nanoparticles as Highly Efficient Catalysts for Electro-oxidation of Methanol/Formic Acid", *Materials Research Society Spring Meeting*, April 12^{ed} **2012**, San Francisco, CA.

External Grants

Current Grants

- PI, NSF CHE – Chemical Catalysis Program, CAREER
- PI, DOE EERE BETO Office
- PI, NSF DMR – Solid State Materials Chemistry Program
- PI, NSF CBET – Catalysis Program
- Co-PI, NSF CBET – Catalysis Program
- PI, ACS Petroleum Research Fund, New Direction Grant

Expired Grants in the UVA

- PI, Jeffress Trust Awards Program in Interdisciplinary Research
- Co-PI, DOE SBIR – Solid-State Lighting Program

Professional Service

Guest Editor, *Green Energy & Environment*, **2017**

Special issue on "New Energy Catalysis"

Guest Editor, *Frontiers in Chemistry*, **2018**

Special issue on "Photocatalysis for Environmental Applications"

Symposium Organizer, 254th ACS National Meeting, Washington DC, **2017**

"Cooperative catalysis at surfaces and interfaces: impact on chemistry and energy frontiers"

Division of Catalysis Science and Technology

"Advanced Nanomaterials Catalysts for Sustainable Energy & Fuel"

Division of Energy and Fuel

Symposium Organizer, 256th ACS National Meeting, Boston, **2018**

"Advanced Catalytic Materials with Well-Defined Nanostructures for Energy and Fuel Sustainability",

Division of Catalysis Science and Technology

Reviewer for peer-reviewed journals:

Nature Catalysis, Nature Sustainability, Journal of the American Chemical Society, Nature Communication, Science Advances, Angewandte Chemie International Edition, Nano Letters, Advanced Materials, ACS Nano, Chemical Sciences, ACS Catalysis, ACS Energy Letters, Energy and Environmental Science, Journal of Catalysis, Nano Today, Nanoscale, Nano Research, ChemCatChem, ACS Applied Materials&Interfaces, ACS Applied Energy Materials, Langmuir, Advanced Science, Applied Catalysis: B, Fuel, Electrochimica Acta

Faculty Organizer, UVA-Heritage University Graduate Facilitators Program since **2018**.

Leading Organizer, Virginia Clean Energy and Catalysis Club, Organizing monthly invited talk series and annual summit (VA CECC website: <https://uva.theopenscholar.com/2021virginiacleanenergycatalysis/>) **2021-present**.